Naval Facilities Engineering Systems Command

Naval Facilities Engineering Systems Command Northwest

Final

Tier I Sampling and Analysis Plan Water and Sediment Sampling at Operable Unit 1, Area 1 Former Landfill

NAVAL BASE KITSAP KEYPORT

KEYPORT, WASHINGTON

April 2023

SAP Worksheet #1: Title and Approval Page

Final
Tier I Sampling and Analysis Plan
Water and Sediment Sampling at Operable Unit 1, Area 1 Former Landfill

Naval Base Kitsap Keyport, Washington

13 April 2023

Prepared for:

Department of the Navy
Naval Facilities Engineering Systems Command Northwest
1101 Tautog Circle, Suite 203
Silverdale, WA 98315-1101

Prepared by:
EA Engineering, Science, and Technology, Inc., PBC
2200 6th Avenue, Suite 707
Seattle, WA 98121

Prepared under:
Contract N44255-20-D-6006, Task Order No. N4425522F4065
DCIN: EA-LTM/OM-6006-23-0082

Review Signature: 13 April 2023
Dana Ramquist, EA Task Order Manager Date

Approval Signature: Brenda O. Nuding 13 April 2023
Brenda Nuding, EA QA Manager Date

Approval Signature: See reverse
Ken Bowers, NAVFAC LANT Chemist Date

Approval Signature: ROHRBAUGH.AMANDA.LYNN.1400915292 Digitally signed by ROHRBAUGH.AMANDA.LYNN.1400915292 Date: 2023.04.19 11:52:13 -07'00'
Amanda Rohrbaugh,
NAVFAC Northwest Remedial Project Manager Date

SAP Worksheet #1: Title and Approval Page

Internal Draft
Tier I Sampling and Analysis Plan
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XX ~~October~~November~~23 August~~ 2022

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Contract N44255-20-D-6006, Contract Task Order N4425522F4065
DCIN: EA-LTM/OM-6006-22-0137

Review Signature: *Final to be signed*
Dana Ramquist, EA Task Order Manager Date

Approval Signature: *Final to be signed*
Brenda Nuding, EA QA Manager Date

Approval Signature: *Final to be signed* BOWERS.KENNETH.A.1230092474
Digitally signed by BOWERS.KENNETH.A.1230092474
Date: 2022.11.23 09:28:53 -05'00'
Ken Bowers~~To be determined~~, NAVFAC LANT Chemist Date

Approval Signature: *Final to be signed*
Amanda Rohrbaugh, Date
NAVFAC Northwest Remedial Project Manager

Executive Summary

This Tier I Sampling and Analysis Plan (SAP) presents the site background, schedule, project organization, project and data quality objectives, sampling approach, rationale, analyses, quality assurance (QA) and quality control (QC) and field procedures, data evaluation, and reporting procedures to be implemented by EA Engineering, Science, and Technology, Inc., PBC and its subcontractors for the monitoring activities at the Operable Unit (OU) 1 at Naval Base Kitsap (NBK) Keyport, Washington. EA is herein referenced as the Contractor. These activities will be administered under Naval Facilities Engineering Systems Command (NAVFAC) Northwest Contract N44255-20-D-6006, Task Order N44255-22-F-4065.

NBK Keyport occupies 340 acres (including tidelands) adjacent to Keyport in Kitsap County, Washington, on a small peninsula in the central portion of the west side of the Puget Sound. The peninsula is bordered by Liberty Bay to the northwest, north, and northeast and by Port Orchard inlet to the east and southeast. Marine and brackish water bodies on and near the site consist of Liberty Bay, Dogfish Bay, the tide flats, a marsh, and a shallow lagoon. Freshwater bodies include two creeks discharging into the marsh pond and two creeks discharging into the lagoon. The topography of the site rises gently from the shoreline to an average of 25 to 30 feet above mean sea level, and then rises steeply at the southeast corner of the site to approximately 130 feet above mean sea level.

NBK Keyport OU 1 consists of Area 1, which is the former base landfill and adjacent areas to the northwest, west, and south. The OU 1 Record of Decision (ROD) was executed in September 1998 by the United States (U.S.) Department of the Navy (DON), U.S. Environmental Protection Agency (EPA), and Washington State Department of Ecology. The ROD specifies the maintenance of phytoremediation plantations and cover over the former landfill; maintenance of a tide gate; institutional controls; and long-term monitoring (LTM) of groundwater, surface water, a groundwater seep, sediment, and marine tissue. As specified in the OU 1 ROD, monitoring for volatile organic compounds in groundwater is performed as part of the LTM program. LTM monitoring is currently suspended while separate investigation is being conducted to gain a further understanding of the presence and concentrations of contaminants.

This SAP addresses sampling at select locations in support of the supplemental remedial investigation work that is on-going at OU 1, Area 1 under separate contracts. This includes the following:

- Groundwater sampling and analysis for chlorinated volatile organic compounds, metals, polycyclic aromatic hydrocarbons, polychlorinated biphenyl (PCB) Aroclors, 1,4-dioxane, and per- and polyfluoroalkyl substances at the causeway

monitoring wells in support of the OU 1 Human Health and Ecological Risk Assessment being conducted under a separate contract (DON 2021b)
- Sediment sampling and analysis near Marsh Creek for PCB congeners using incremental sampling methodology in support of a source investigation being conducted under a separate contract (DON 2021a).

The SAP was prepared in accordance with the *Uniform Federal Policy for Quality Assurance Project Plans* (EPA 2005) and *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS* (EPA 2001) using the NAVFAC Tier I SAP format to ensure that the data collected are precise, accurate, representative, complete, and comparable to meet their intended use. The purpose of this SAP is to provide guidance and QA/QC for specific sampling and analysis activities to be performed at NBK Keyport OU 1. This SAP will be used as a reference document by EA and laboratory personnel engaged in the sampling and LTM activities.

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Acronyms and Abbreviations

°C	*degrees Celsius*
µg/L	*microgram(s) per liter*
%D	*percent difference*
%R	*percent recovery*
amu	*atomic mass unit*
CCB	*continuing calibration blank*
CCV	*continuing calibration verification*
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
cm	centimeter
COC	*chemical of concern*
COPC	*chemical of potential concern*
COD	*coefficient of determination*
COR	*Contracting Officer's Representative*
CPR	*cardiopulmonary resuscitation*
CSM	*conceptual site model*
CVAAS	*cold-vapor atomic absorption spectrometer*
cVOC	*chlorinated volatile organic compound*
CWA	*Clean Water Act*
DCA	*dichloroethane*
DI	*deionized*
DL	*detection limit*
DoD	*Department of Defense*

DON	*Department of the Navy*
DOT	Department of Transportation
DQI	*data quality indicator*
DU	decision unit
EA	*EA Engineering, Science, and Technology, Inc., PBC*
Ecology	*Washington State Department of Ecology*
EICP	*extracted ion current profile*
EIM	*Environment Management System*
ELAP	*Environmental Laboratory Accreditation Program*
ELLE	*Eurofins Lancaster Laboratories Environmental*
EPA	*U.S. Environmental Protection Agency*
FP	*field procedure*
FS	*feasibility study*
FTL	*Field Team Leader*
GC-ECD	*gas chromatography – electron capture detector*
GC/MS	*gas chromatography/mass spectrometry*
HAZWOPER	*Hazardous Waste Operations and Emergency Response*
HCl	*hydrochloric acid*
HDPE	*high-density polyethylene*
HH/ERA	*human health/ecological risk assessment*
HRGC/HRMS	*high-resolution gas chromatography/high resolution mass spectrometry*
ICAL	*initial calibration*
ICB	*initial calibration blank*
ICP/MS	*inductively coupled mass spectrometry*
ICS	*interference check solution*

ICV	*initial calibration verification*
ID	*identification*
IS	*internal standard*
ISM	*incremental sampling methodology*
ITRC	Interstate Technology and Regulatory Council
LC/MS/MS	*liquid chromatography with tandem mass spectrometry*
LCS	*laboratory control sample*
LDPE	*low-density polyethylene*
LNAPL	*light non-aqueous phase liquid*
LOD	*limit of detection*
LOQ	*limit of quantitation*
LTM	*long-term monitoring*
MCL	*maximum contaminant level*
MDL	*method detection limit*
mg/kg	milligram per kilogram
mL	*milliliter*
MPC	*measurement performance criteria*
MS	*matrix spike*
MSD	*matrix spike duplicate*
MTCA	*Model Toxics Control Act*
NA	*not applicable*
NAVFAC	*Naval Facilities Engineering Systems Command*
NBK	*Naval Base Keyport*
NC	*no criterion*
ng/kg	*nanograms per kilogram*

NHO_3	*nitric acid*
NTR	*Navy Technical Representative*
NW	*northwest*
OSHA	*Occupational Safety and Health Administration*
OU	*Operable Unit*
PAH	*polycyclic aromatic hydrocarbon*
PAL	project action limit
PBC	*Public Benefit Corporation*
PCB	*polychlorinated biphenyl*
PDF	*portable data format*
PFAS	*per- and polyfluoroalkyl substances*
PFAS PA	*Preliminary Assessment for Per- and Polyfluoroalkyl Substances*
PFBS	*perfluorobutanesulfonic acid*
PFOA	*perfluorooctanoic acid*
PFOS	*perfluorooctanesulfonic acid*
pH	*potential hydrogen*
POC	*point of contact*
PQAM	*Project Quality Assurance Manager*
PQCM	*Project Quality Control Manager*
PQO	*project quality objective*
QA	*quality assurance*
QC	*quality control*
QSM	*Quality Systems Manual for Environmental Laboratories*
RAO	*remedial action objective*
RF	*response factor*

RG	*Remediation Goal*
RI	*Remedial Investigation*
ROD	*Record of Decision*
RPD	*relative percent difference*
RPM	*Remedial Project Manager*
RRT	*relative retention time*
RSD	*relative standard deviation*
RSL	regional screening level
SAP	*Sampling and Analysis Plan*
SIM	*selected ion monitoring*
SME	*sporadic marginal exceedance*
SMS	*sediment management standards*
SOP	*standard operating procedure*
SS	*Site Supervisor*
SSHO	*Site Safety and Health Officer*
SVOC	*semi-volatile organic compound*
TBD	*to be determined*
toc	top of casing
TOM	*Task Order Manager*
UFP-QAPP	*Uniform Federal Policy for Quality Assurance Project Plans*
VOA	*volatile organic analysis*
VOC	*volatile organic compound*
WAC	*Washington Administrative Code*

SAP Worksheet #2: Sampling and Analysis Plan Identifying Information

Site Name/No.: Operable Unit (OU 1) Area 1 Former Landfill, Naval Base Kitsap (NBK) Keyport, in Keyport, Washington

Operable Unit: OU 1

Contractor Name: EA Engineering, Science, and Technology, Inc., PBC (EA)

Contract Number: N44255-20-D-6006, Task Order N44255-22-F-4065

Contract Title: Long-Term Monitoring, Operations, and Maintenance, Navy Region Northwest Program Services

Work Assignment Number (optional): Not applicable (NA)

1. This Sampling and Analysis Plan (SAP) was prepared in accordance with the requirements of the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) (U.S. Environmental Protection Agency [EPA] 2005) and the Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA 2002).
2. Identify regulatory program: In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act, and as applicable, those sections of the National Oil and Hazardous Substances Pollution Contingency Plan, found at 40 Code of Federal Regulation (CFR) Subparts E through I (§300.400 to §300.825), including compliance with §300.825(a)(2) and 300.435(c)(2)(ii), as authorized by Section 117(c)(1) of CERCLA (42 USC § 9617).
3. This SAP is site-specific.
4. List organizational partners (stakeholders) and identify the connection with lead organization:

Organization Partners/Stakeholders	Connection	Date
EPA	Regulator	1998
Washington State Department of Ecology (Ecology)	Lead Regulator	1998
Suquamish Tribe	Stakeholder	1998

5. Lead Agency: Naval Facilities Engineering Systems Command (NAVFAC) Northwest.

6. If the required SAP elements and required information are not applicable to the project or are provided elsewhere, then note the omitted SAP elements and provide an explanation for their exclusion below:

   None

SAP Worksheet #3: Distribution List

SAP Recipients	Title	Organization	Telephone Number (optional)	E-mail Address or Mailing Address
Ben Leake	Project Manager	EPA	(503) 326-2859	Leake.Benjamin@epa.gov
Binod Chaudhary	Project Manager	Ecology	(564) 669-3015	bcha461@ECY.WA.GOV
Andrew Schmeising	Project Manager	Suquamish Tribe	(360) 394-7111	aschmeising@suquamish.nsn.us
Amanda Rohrbaugh	Navy RPM/NTR	NAVFAC Northwest	(360) 396-0248	amanda.l.rohrbaugh.civ@us.navy.mil
Contractor Personnel	**Title**	**Organization**	**Telephone Number (optional)**	**E-mail Address or Mailing Address**
Brenda Nuding	PQAM, Senior Chemist	EA	(808) 256-8268	bnuding@eaest.com
Sherri Wunderlich	Project Chemist	EA	(360) 337-0788	swunderlich@eaest.com
Rob Marcase	Health and Safety Manager, Certified Industrial Hygienist	EA	(410) 329-5192	rmarcase@eaest.com
Dana Ramquist	TOM, SSHO	EA	(206) 992-0721	dramquist@eaest.com
Camille Warren	Alternate TOM	EA	(720) 626-6415	cwarren@eaest.com
Will Kaage	PQCM	EA	(360) 420-2372	wkaage@eaest.com
Sam Stamper	FTL, alternate SSHO	EA	(360) 399-9442	sstamper@eaest.com
Hannah Dennis	Alternate FTL, Field Team	EA	(206) 452-5359	hdennis@eaest.com
Halie Hajek	Field Team	EA	(219) 851-6022	hhajek@eaest.com
Kylan Hopper	Field Team, alternate SSHO	EA	(360) 391-7611	khopper@eaest.com
Merry Clayton	Field Team	EA	(208) 691-1536	mclayton@eaest.com
Subcontractor Personnel	**Title**	**Organization**	**Telephone Number (optional)**	**E-mail Address or Mailing Address**
Mandy Barnhart	Project Manager	ELLE	(717) 556-386	amanda.barnhart@et.eurofinsus.com
David Alltucker	Project Manager	Eurofins Sacramento	(916) 374-4383	david.allutucker@et.eurofinsus.com
Tracy Dutton	Project Manager	Eurofins Seattle	(253) 248-4970	tracy.dutton@et.eurofinsus.com
Diane Waldschmidt	Project Manager	Environmental Data Services	(412) 408-3288	dwaldschmidt@eds-us.net

Notes:
EA = EA Engineering, Science, and Technology, Inc., PBC
Ecology = Washington Department of Ecology
ELLE = Eurofins Lancaster Laboratories Environmental
EPA = U.S. Environmental Protection Agency
FTL = Field Team Leader
NAVFAC = Naval Facilities Engineering Systems Command
PQAM = Project Quality Assurance Manager
PQCM = Project Quality Control Manager
QC = quality control
RPM = Remedial Project Manager
SSHO = Site Safety and Health Officer
TOM = Task Order Manager

SAP Worksheet #4: Project Personnel Sign-Off Sheet

The signature indicates that key personnel have read the applicable SAP sections and will perform the tasks as described. The Contractor will ensure that the key personnel have read the SAP.

Name	Title/Role	Signature/email receipt	SAP Section Reviewed	Date SAP Reviewed
Dana Ramquist	TOM, SSHO			
Camille Warren	Alternate TOM			
Sam Stamper	FTL, alternate SSHO			
Will Kaage	PQCM			
Halie Hajek	Field Team			
Hannah Dennis	Alternate FTL, Field Team			
Kylan Hopper	Field Team			
Merry Clayton	Field Team			
Brenda Nuding	PQAM, Senior Chemist			
Subcontractors				
Mandy Barnhart	Project Manager (ELLE)			
David Alltucker	Project Manager (Eurofins Sacramento)			
Tracy Dutton	Project Manager (Eurofins Seattle)			
Diane Waldschmidt	Project Manager (Environmental Data Services)			

Notes:
ELLE = Eurofins Lancaster Laboratories Environmental
FTL = Field Team Leader
PQAM = Project Quality Assurance Manager
PQCM = Project Quality Control Manager
SAP = Sampling and Analysis Plan
SSHO = Site Safety and Health Officer
TOM = Task Order Manager

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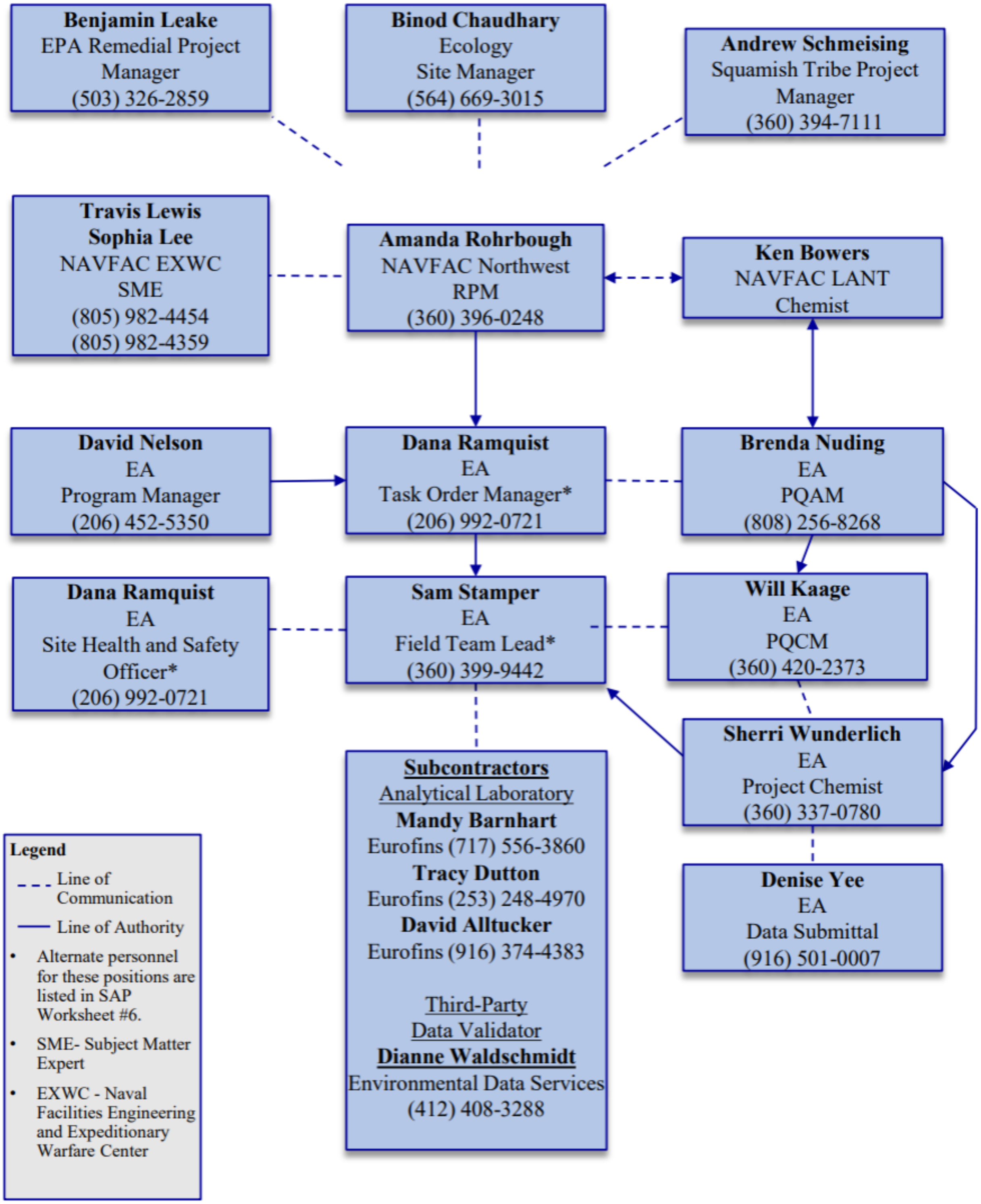
SAP Worksheet #5: Project Organizational Chart



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SAP Worksheet #6: Communication Pathways

The communication pathways for the SAP are shown below.

Communication Drivers	Responsible Entity/Title	Name	Phone Number	Email	Procedure (Timing, Pathway To/From, etc.)
POC with regulatory agencies	NAVFAC Northwest RPM	Amanda Rohrbaugh	(360) 396-0248	amanda.l.rohrbaugh.civ@us.navy.mil	Primary Navy Technical POC. Coordinates activities and communication between the Navy, regulatory agencies, and contractors.
Notice to Proceed with field work	NAVFAC Northwest Task Order COR	Amanda Rohrbaugh	(360) 396-0248	amanda.l.rohrbaugh.civ@us.navy.mil	Will e-mail or provide verbal notice to proceed after Final SAP is completed.
SAP amendments	NAVFAC Northwest RPM	Amanda Rohrbaugh	(360) 396-0248	amanda.l.rohrbaugh.civ@us.navy.mil	The Navy RPM will review the planning documents, deviations, and related documents and forward them to the appropriate regulatory representatives.
Stop work due to safety issues	EA TOM/ NAVFAC Northwest COR	Dana Ramquist[1] Amanda Rohrbaugh	(206) 992-0721/ (360) 396-0248	dramquist@eaest.com / amanda.l.rohrbaugh@navy.mil	Verbal communication from EA to NAVFAC Northwest COR as soon as possible.
Manage project phases	EA TOM	Dana Ramquist[1]	(206) 992-0721	dramquist@eaest.com	Will serve as the POC for EA. TOM will direct and approve communication with the Navy RPM. TOM will provide periodic progress reports and notify the Navy RPM of field changes or modifications via e-mail or verbally by close of business the following business day. EA's liaison to the NAVFAC Northwest NTR shall have the authority for stopping work and shall notify the FTL directly if stopping work is necessary.
Change in site conditions requiring change in scope of work	EA TOM	Dana Ramquist	(206) 992-0721	dramquist@eaest.com	Will e-mail or provide verbal communication from TOM or FTL to NAVFAC Northwest COR as soon as possible.
Daily field report and field coordination	EA FTL	Sam Stamper[2]	((360) 399-9442	sstamper@eaest.com	The FTL will lead the field sampling team during fieldwork as directed by the TOM. The FTL will prepare records documenting field activities and provide field progress reports to TOM on a daily basis.
SAP changes in the field	EA FTL	Sam Stamper[2]	(360) 399-9442	sstamper@eaest.com	The FTL will carry out project tasks in the field. Responsible for notifying the TOM of potential variances to the SAP made in the field on a daily basis via e-mail of verbally. The FTL will serve as the field operations POC.

Communication Drivers	Responsible Entity/Title	Name	Phone Number	Email	Procedure (Timing, Pathway To/From, etc.)
Corrective actions in the field	EA PQCM	Will Kaage	(360) 420-2373	wkaage@eaest.com	The PQCM will have the authority to stop work and issue corrective response actions to field sampling personnel. Modes of communications will be by telephone or e-mail within 24 hours.
Laboratory and data validation coordination	EA Project Chemist	Sherri Wunderlich	(360) 337-0780	swunderlich@eaest.com	The Project Chemist will procure data and coordinate with the analytical laboratory. Will ensure adherence to the analytical plan. Will coordinate with data validators. Will review and summarize data validation reports upon receipt.
Reporting laboratory data quality issues and variances	EA Project Chemist	Sherri Wunderlich	(360) 337-0780	swunderlich@eaest.com	The analytical laboratory will report QA/QC issues to the Project Chemist. The Project Chemist will report significant variance(s) to TOM and PQAM on the same business day and assist in notifying the Navy RPM within 2 business days via e-mail of verbally. At their discretion, the RPM may include the Navy LANT Chemist in the discussions.
Analytical requirements	Eurofins Seattle ELLE Eurofins Sacramento	Tracy Dutton Amanda Barnhart David Alltucker	(253) 248-4970 (717) 556-3860 (916) 374-4383	TracyDutton@et.eurofinsus.com Amanda.Barnhart@et.eurofinsus.com David.Alltucker@et.eurofinsus.com	Laboratory Project Manager will communicate with the Project Chemist or designee to ensure that laboratory analyses are conducted in accordance with contract requirements.
Data validation requirements	Environmental Data Services	Diane Waldschmidt[3]	(412) 408-3288	dwaldschmidt@eds-us.net	Data validator will communicate with the Project Chemist or designee to ensure that data validation is conducted in accordance with contract requirements.
Corrective actions for analytical variances or data validation variances	EA Project Chemist	Sherri Wunderlich	(360) 337-0780	swunderlich@eaest.com	The Project Chemist will immediately notify the TOM and the laboratory or data validation project managers by e-mail of significant field or analytical or validation procedures that were not performed in accordance with the planning documents. The Project Chemist will document the non-conformance and issue the corrective actions to be taken and will verify implementation of the corrective actions by the laboratory and data validation firms. Modes of communication will be by telephone or e-mail. The Project Chemist will determine the need for corrective actions, amendments, modifications, notifications, and response to sampling or analysis issues within 1 day of variance.

Communication Drivers	Responsible Entity/Title	Name	Phone Number	Email	Procedure (Timing, Pathway To/From, etc.)
Release of analytical data	EA Project Chemist	Sherri Wunderlich	(360) 337-0780	swunderlich@eaest.com	Data will not be released until the completion of validation, review, and acceptance of the data by the Project Chemist

Notes:
[1] Alternate EA TOM is Camille Warren (720) 626-6415, cwarren@eaest.com).
[2] Alternate EA FTL is Hannah Dennis (206) 452-5359, hdennis@eaest.com).
[3] Alternate data validation firm is Laboratory Data Consultants; the project manager is Pei Geng (760) 827-1100, pgeng@lab-data.com).

COR = Contracting Officer's Representative
EA = EA Engineering, Science, and Technology, Inc., PBC
ELLE = Eurofins Lancaster Laboratories Environmental
FTL = Field Team Leader
NAVFAC = Naval Facilities Engineering Systems Command
NTR = Navy Technical Representative
POC = point of contact
PQAM = Project Quality Assurance Manager
PQCM = Project Quality Control Manager
QA = quality assurance
QC = quality control
RPM = Remedial Project Manager
SAP = Sampling and Analysis Plan
TOM = Task Order Manager

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SAP Worksheet #7: Personnel Responsibilities Table

Title/Role	Organizational Affiliation	Responsibilities
RPM/ Amanda Rohrbaugh	NAVFAC Northwest	Primary Navy Technical POC. Coordinates activities and communication between the Navy, regulatory agencies, and contractors.
NTR/ Amanda Rohrbaugh	NAVFAC Northwest	Oversees technical aspects of project.
COR/ Amanda Rohrbaugh	NAVFAC Northwest	Responsible for monitoring the Contractor’s technical performance.
Program Manager/ David Nelson	EA	Manages program contract. Duties include: • Ensuring compliance with contract terms and conditions. • Managing adequate resources for completing project.
TOM and SSHO/ Dana Ramquist[1]	EA	As TOM, manages the project. Duties include: • Communication with Navy RPM and NTR. • Ensuring compliance with contract terms and conditions. • Understand and ensure compliance with environmental regulations and other applicable or relevant and appropriate requirements. • Assign project personnel consistent with contract requirements. • POC with Navy RPM and NTR. As SSHO: Implements and ensures compliance with the health and safety plan. Duties include: • Halting fieldwork if unsafe conditions detected. • Managing health and safety of site and field personnel and ensuring that subcontractors and vendors adhere to contract documents, applicable codes, standards, and regulations regarding health and safety. • Serving as on-site POC for safety and health issues. • Assessing the condition of the site. • Ensuring that appropriate personal protective equipment is utilized. • Maintaining effective health and safety records.
FTL/ Sam Stamper[1]	EA	Leads the field sampling team during fieldwork as directed by the TOM. Duties include: • Preparing records documenting field activities • Providing field progress reports to the TOM • Notifying the TOM of potential variances to the SAP made in the field • Serving as the field operations POC.

Title/Role	Organizational Affiliation	Responsibilities
PQCM Will Kaage[1]	EA	Ensures proper implementation of the QC program. Duties include: • Monitoring QC activities to ensure compliance with authorized policies and procedures • Identifying and resolving non-conformances in accordance with environmental regulations, contractual requirements, and SAP requirements • Ensuring site monitoring, worker training, and effective selection and use of proper personal protective equipment. • Tracking and verifying implementation of corrective actions. • Ensuring that record, logs, permits, regulatory-required documentation, manufacturer's instruction, warranties, standard procedures, and project plans are properly maintained and stored.
Project Chemist/ Sherri Wunderlich	EA	Manages data and coordinates with the analytical laboratory and data validator. Duties include: • Ensuring adherence to the SAP. • Reviewing and summarizing data validation reports upon receipt. • Notifying the TOM and the laboratory or data validation project managers by email of field or analytical or validation procedures that were not performed in accordance with the planning document. • Documenting non-conformances and issuing the corrective actions to be taken • Verifying implementation of the corrective actions by the laboratory and data validation firms.

Notes:

[1] Alternate personnel are listed in Worksheet #6.

COR = Contracting Officer's Representative
EA = EA Engineering, Science, and Technology, Inc., PBC
FTL = Field Team Leader
NAVFAC = Naval Facilities Engineering Systems Command
NTR = Navy Technical Representative
POC = point of contact
PQCM = Project Quality Control Manager
QC = quality control
RPM = Remedial Project Manager
SAP = Sampling and Analysis Plan
SSHO = Site Safety and Health Officer
TOM = Task Order Manager

SAP Worksheet #8: Special Personnel Training Requirements

Project Function	Specialized Training by Title or Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/ Organizational Affiliation	Location of Training Records/Certificates
SSHO	40-Hour OSHA HAZWOPER	Various	Current	Supervisory staff SSHO	EA	EA Human Resources
SSHO	30-Hour OSHA Construction Safety	Various	Current	Supervisory staff SSHO	EA	EA Human Resources
SSHO	CPR, First Aid, Bloodborne Pathogens	Various	Current	Supervisory staff SSHO	EA	EA Human Resources
QA/QC	Construction Quality Management	Various	Current	PQCM	EA	EA Human Resources

Notes:

CPR = cardiopulmonary resuscitation
EA = EA Engineering, Science, and Technology, Inc., PBC
HAZWOPER = Hazardous Waste Operations and Emergency Response
OSHA = Occupational Safety and Health Administration
PQCM = Project Quality Control Manager
QA = quality assurance
QC = quality control
SSHO = Site Safety and Health Officer

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SAP Worksheet #9: Project Planning Session Participants Sheet

Project Name:	2022 Keyport Long-Term Monitoring and Operations and Maintenance	**Site Name:**	OU 1
Projected Date(s) of Sampling:	September 2022 through December 2022	**Site Location:**	NBK Keyport
Contractor Task Order Manager:	Dana Ramquist		
Date of Session:	21 April 2022		
Scoping Session Purpose:	To become acquainted with the various parties involved with the project; to discuss the scope of the proposed work including scheduling, coordination, and deliverables; and to define channels of communication and POCs.		

Name	Title	Affiliation	Phone #	E-mail Address	Project Role
Carlotta Cellucci.*	RPM, NTR	NAVFAC Northwest	(360) 396-0060	carlotta.cellucci.civ@us.navy.mil	Primary Navy Technical POC. Coordinates activities and communication between the Navy, regulatory agencies, and contractors.
Amanda Rohrbaugh	RPM	NAVFAC Northwest	(360) 396-0248	amanda.l.rohrbaugh.civ@us.navy.mil	Alternate Navy Technical * POC. Coordinates activities and communication between the Navy, regulatory agencies, and contractors (note that since the planning session, role has changed to Primary Navy Technical POC and NTR).
David Nelson	Program Manager	EA	(206) 452-5348	dnelson@eaest.com	Manages adequate resources for completing the project.
Dana Ramquist	TOM	EA	(260) 992-0721	dramquist@eaest.com	Will serve as the POC for EA. TOM will direct and approve communication with the Navy RPM. TOM will provide periodic progress reports and notify the Navy RPM of field changes or modifications by close of business the following business day. EA’s liaison to the NAVFAC Northwest Navy Technical Representative shall have the authority for stopping work and shall notify the FTL or SS directly if stopping work is necessary.

Notes:
* = Carlotta Cellucci has retired; duties assumed by Amanda Rohrbaugh.
FTL = Field Team Leader
EA = EA Engineering, Science, and Technology, Inc., PBC
NAVFAC = Naval Facilities Engineering Systems Command
NTR = Navy Technical Representative
POC = point of contact
RPM = Remedial Project Manager
SS = Site Superintendent
TOM = Task Order Manager

Consensus Decisions:

The SAP will be prepared by EA as contracted.

Meeting minutes are provided in Appendix E.

SAP Worksheet #10: Conceptual Site Model

This section describes the current conceptual site model (CSM) for OU 1, Area 1. Provided is a description of the site hydrogeologic setting, source areas, contaminated media including chemicals of concern (COCs) identified in the Record of Decision (ROD) (DON, EPA, and Ecology, 1998) and other chemicals of potential concern (COPCs), fate and transport mechanisms, exposure pathways, and receptors.

10.1 Overview

The existing long-term monitoring (LTM) program at OU 1, Area 1 involves periodic sampling of groundwater and measurement of water levels for the upper and intermediate aquifers to monitor the groundwater flow direction. LTM at OU 1, Area 1 is currently postponed.

This SAP addresses sampling at select locations in support of other activities that include the following:

- Groundwater sampling and analysis for chlorinated volatile organic compounds (cVOCs), metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) Aroclors, 1,4-dioxane, and per- and polyfluoroalkyl substances (PFAS) at the causeway monitoring wells in support of the OU 1 Human Health and Ecological Risk Assessment (HH/ERA) being conducted under a separate contract (DON 2021b), and
- Sediment sampling and analysis near Marsh Creek for PCB congeners using incremental sampling methodology (ISM) in support of a source investigation being conducted under a separate contract (DON 2021a).

The sampling design described in this SAP is intended to be consistent with existing SAPs that address related work associated with the above bullets (DON 2021b and 2021a, respectively).

10.2 Site Description, History, and Environmental Setting

10.2.1 Site Description

NBK Keyport occupies 340 acres (including tidelands) adjacent to Keyport in Kitsap County, Washington, on a small peninsula in the central portion of the west side of the Puget Sound. The peninsula is bordered by Liberty Bay to the northwest, north, and northeast and by Port Orchard inlet to the east and southeast (Figure 1). The Keyport property was acquired by the Navy in 1913, with property acquisition continuing through World War II. The property was first used as a quiet-water range for torpedo testing.

The first range facility was located in Port Orchard Inlet southeast of the site (DON 2022a).

Marine and brackish water bodies on and near the site consist of Liberty Bay, Dogfish Bay, the tide flats, a marsh, and a shallow lagoon. Freshwater bodies include two creeks discharging into the marsh pond and two creeks discharging into the lagoon. The topography of the site rises gently from the shoreline to an average of 25 to 30 feet above mean sea level, and then rises steeply at the southeast corner of the site to approximately 130 feet above mean sea level.

The unconfined shallow water-bearing unit, interpreted in the ROD to include two distinct aquifers, has been determined to be one aquifer through recent additional investigations, is the primary focus of this investigation, and is present throughout the landfill area. The water table in this shallow water-bearing zone intersects the landfill waste material beneath much of the landfill. That is, roughly 5 feet of landfill material lies above the shallow groundwater surface in the unsaturated zone, and up to about 5 feet of material lies beneath the water table in the saturated zone (DON, EPA, and Ecology, 1998).

Shallow groundwater flow has consistently been interpreted to flow through the landfill in a radial direction and discharge into the marsh and creek system northwest, west, southwest, and south of the landfill. Deeper groundwater in this same water-bearing zone (historically considered the “intermediate aquifer”) has been interpreted to flow toward the northwest. The depth to first groundwater is typically 4 to 5 feet below ground surface in the landfill.

Groundwater/surface water tidal interaction and groundwater salinity studies were performed historically, and the results included in the 1997 summary data assessment report (DON 1997b). Additional assessment of tidal influence was performed during phytoremediation monitoring. The 1997 Focused Feasibility Study (FS) concluded that groundwater levels at OU 1 are influenced by seasonal and tidal changes. The study concluded that these influences were not enough to change the general groundwater flow patterns and that tidal influence occurs in wells close to the shore. The tidal influence rapidly attenuates with distance from the tide flats or Dogfish Bay, with a maximum tidal fluctuation in groundwater measured prior to 1997 of 2.5 feet (DON 1997a).

OU 1, Area 1, is the former base landfill and adjacent potentially impacted areas to the northwest, west, and south. The former landfill comprises approximately 9 acres in the western part of the base, located adjacent to a wetland area and the tide flats which flow into Dogfish Bay (Figures 2 and 3). Most of the landfill area was formerly marshland. The base of the landfill is not lined, and the top is covered with areas of grass, trees, concrete, and asphalt. Data generated to date indicate that the unlined landfill is an ongoing source of groundwater contamination which may impact downgradient groundwater, surface water, and sediments. During various site investigation and assessment studies between 1984 and 1988, OU 1, Area 1 was determined to have possible environmental contamination. In 1989, NBK Keyport was officially listed on the National Priorities List, becoming a Superfund site under CERCLA. OU 1, Area 1 was included in a RI/FS that was conducted at NBK Keyport between 1988 and 1993 (DON 2019), and the RI included human health and ecological risk assessments (DON 1993c). Based on the risk assessments, two classes of chemicals, cVOCs and PCBs, were identified as COCs at the site; cVOCs are COCs for soil, sediment, tissue, groundwater, and surface water throughout the landfill; PCBs are COCs for a specific area of sediment and seep water at OU 1, Area 1.

10.2.2 Site History

The NBK Keyport property was acquired by the DON in 1913 and first used as a quiet water range for torpedo testing. The base was expanded during World Wars I and II. During the early 1960s, manufacturing and fabrication operations such as welding, metal plating, carpentry, and sheet metal work were added. In 1978, the facility's function broadened to include various undersea warfare weapons and systems engineering and development activities. Operations currently include test and evaluation, in-service engineering, maintenance and repair, and fleet readiness and industrial base support for undersea weapons systems, countermeasures, and sonar systems.

OU 1, Area 1 is the former base landfill which was formerly a marshland (Figure 2). The landfill was the primary disposal area for both domestic and industrial wastes generated by the base from the 1930s until closure of the landfill in 1973. A burn pile for trash and demolition debris was located at the north end of the landfill from the 1930s to the 1960s. Unburned or partially burned materials from this pile were buried in the landfill or pushed into the marsh. A trash incinerator was operated at the north end of the landfill from the 1930s to the 1960s, and incinerator ash was disposed of in the landfill. Burning continued at the landfill until the early 1970s.

10.2.3 Environmental Setting

The former base landfill was created in a marsh; marsh and tidal flat deposits underlie the landfill and fill materials in many places. Underneath the marsh and tide sediments are various layers of glacial deposits, ranging from sands and gravels to silts and clay. The deposits are very complex and not always continuous across the area.

A number of water and non-water-bearing layers (hydrostratigraphic units) were identified during pre-ROD investigations. However, site characterization efforts over the past five years have redefined the hydrogeology at the site. Although three aquifers were identified in the ROD (DON, EPA, and Ecology, 1998), the "aquitard" between the upper and intermediate aquifers was found to be the marsh bottom sediments, which do not effectively function as an aquitard and have been removed in places beneath the landfill. The current hydrogeologic interpretation is an upper aquifer that extends over 55 feet to the regional aquitard interpreted to be the Clover Park Unit (DON 2017).

The Clover Park Unit is a regional non-glacial unit of varying thickness and composition and underlies the entire vicinity of Keyport. Near OU 1, this unit is believed to be approximately 100 to 200 feet thick, consisting of predominantly silt, clay, peat, and fine sand with interlayers of sand and gravel (DON 1997b). The upper surface of the Clover Park Unit is considerably eroded, which has created a subsurface trough-like feature that extends north-south beneath Brownsville Highway, the marsh, and the western side of the tide flats of OU 1. The trough-like feature is filled with thick younger glacial deposits. The Kitsap County Public Utility District well and other public wells are located in the deeper aquifers below the Clover Park Unit. Groundwater in the upper portion of the upper aquifer flows generally radially outward toward the adjacent marsh and stream complex; whereas deeper water in the upper aquifer follows the regional flow direction from southeast to northwest toward the tide flats (Figure 3).

Across the center of the landfill groundwater travels in a westerly direction at a rate of about 30 to 80 feet per year in the upper portion of the aquifer, then discharges to the surface waters of the marsh and tide flats at the rate of about 2,600 to 3,700 gallons per day (DON 1997b). The velocity of the groundwater in the upper aquifer varies from place to place, but on average it takes 5 to 8 years for groundwater in the upper aquifer to travel from Bradley Road on the east side of the landfill across the landfill to the marsh area.

The groundwater flow directions, velocities, and discharge rates may need to be updated as part of the updated CSM (pending). However, based on the results of pre-ROD investigations, groundwater in the deeper portions of the upper aquifer flows generally northwest (Figure 3). The velocity of the groundwater in the intermediate aquifer varies greatly from about 10 to 90 feet per year, and the best estimates are that it takes on average about 27 years for the groundwater to travel from the south end of the landfill to Keys Road, and on average about 50 years for the groundwater to travel from Keys Road (beneath the tide flats) to Highway 308 (Figure 3). The flow discharge rate from the deeper portion of the upper aquifer was estimated to be from 2,000 to 2,400 gallons per day (DON 1997b).

Vertical gradients between the upper portion and deeper portion of the aquifer were thought to indicate that a zone of upward vertical flow exists within the southern and western portions of the landfill, and a zone of downward flow exists within the northeastern part of the landfill (DON, EPA, and Ecology 1998). The vertical gradient was neutral (approximately zero) at MW1-15 in the middle of the landfill (Figure 5).

10.3 Summary of Previous Investigations

In September 1984, DON began the investigation and assessment of the site to identify areas of environmental contamination resulting from past site activities and to select environmental remedies. The RI/FS process and human health and ecological risk assessments for OU 1 were completed in 1993 (DON 1993a, 1993b, and 1993c). A Focused FS was completed in 1997 for OU 1 (DON 1997a). The additional data collected in 1995 and 1996 to supplement the RI were used to evaluate two new pathways, as summarized in the human health risk section of the ROD. The two pathways evaluated were risks to current and future seafood harvesters in the tide flats and Dogfish Bay and current and future off-site residential domestic use of groundwater from what was then thought to be the intermediate aquifer (DON 1993b and 1993c).

The ROD for OU 1 was executed in 1998 (DON, EPA, and Ecology 1998). Selected remedies for the site implemented in 1999 included institutional controls for landfill covers; phytoremediation (tree plantings) on the landfill; installation and ongoing operation and maintenance of a tide gate and culvert to prevent inundation and possible erosion of the landfill from tidal fluctuations; monitoring of natural attenuation in groundwater; and monitoring of downgradient surface water, groundwater seeps, sediments, and marine tissue. The phytoremediation program uses two 1-acre plantations (north and south) located at two source areas containing high volatile organic compounds (VOCs) concentrations (hot spots) identified during the original RI/FS completed in 1997 (DON 2015a).

PCB concentrations in marsh outlet channel sediment were below the levels established by state regulations that would require the sediments to be actively remediated. However, the DON decided to remove the upper layer of sediments downgradient of the landfill seep to reduce the potential for future PCB concentrations to exceed the remediation goal (RG) and to reduce the likelihood of PCBs entering the tide flats. The sediment removal was conducted in late Summer 1999.

The project team agreed on a two-phased approach for site re-characterization designed to collect the data necessary to evaluate remedial alternatives for hot spot treatment to reduce the restoration timeframe. Phase I, completed in 2014, consisted of collecting screening-level data (DON 2015b). The Phase I investigation included the collection of tree core samples analyzed for cVOCs to identify potential contaminant hot spots in groundwater in the vicinity of the South Plantation and west, or downgradient, of the Central Landfill. Given the location (in the Central Landfill between the two plantations and at the western edge of the paved portion of the landfill), it was not possible to collect tree core samples upgradient of MW1-17. Geophysical surveys were also conducted in the South Plantation and a portion of the Central Landfill to identify the presence or absence of subsurface anomalies that could represent potential contaminant sources and pose health risks for workers during future intrusive investigations

The Phase II Additional Investigation, conducted in 2016 and 2017, resulted in a revised understanding of site hydrogeology and identified a single water table aquifer above the regional aquitard, rather than both a shallow and an intermediate aquifer (DON 2017). The investigative work conducted between 2015 and 2019 also delineated the location, depth, and extent of site contaminants, which were found deeper than the existing LTM monitoring well network and farther south into the marsh south of the landfill (DON 2020a). The 2018 groundwater modeling study was conducted to inform risk decisions and update the existing CSM, and the 2019 Source Area Investigation Study was conducted to gather data to verify the migration path of 1,4-dioxane from the Central Landfill to offsite locations, evaluate PCB contamination in site sediments, and better define the extent of contamination on the east side of the South Plantation, in the marsh area south/southeast of the South Plantation, and in Marsh Creek. Continued investigations to evaluate the PCB contaminations in sediments and to evaluate the CSM are ongoing. The internal draft of these investigation results is currently pending.

During the 2017 investigation work at the South Plantation, areas of the Central Landfill and South Plantation were found to have substantially higher cVOC concentrations compared to surrounding areas. However, the data also showed that concentrations of some key VOCs throughout the South Plantation and much of the Central Landfill were orders of magnitude above the RGs (DON 2020c). According to 2017 investigations, the absence of detectable cVOCs in porewater samples located due west of the Central Landfill, and the pattern of highest cVOC concentration observed in grab groundwater samples, cVOCs from the Central Landfill do not appear to be discharging to surface water in this area. In addition, contaminant transport beneath the Central Landfill appears to be to the northwest along a more regional groundwater flow direction.

The 2017 sediment data are similar to concentrations measured before the ROD. The 2017 result at MA-09 could indicate a temporal increase in PCBs at location MA-09, or a spatial variation in concentration in sediment in this area. The measured concentrations could be residual pre-ROD concentrations, given the selective nature of the sediment removal to protect root systems and that no confirmation samples were collected after completion of the sediment removal. Because of the uncertainty regarding sediment concentration trends based on the 2017 results, the 2017 investigation report recommended three additional annual sampling events be performed at the five stations sampled in 2017 (SP1-1, MA-09, MA-14, MA-19, and TF-21) using the same sampling techniques and analytical procedures (DON 2021a).

The elevated concentrations of PCBs in groundwater at well MW1-14, combined with the groundwater flow direction to the northwest and the location of the highest PCB concentrations in sediment and porewater at location MA-09 (down gradient of MW1-14), could imply that recontamination may be occurring from an uncontrolled source within the landfill. In accordance with the recontamination requirements of the Sediment Management Standards (SMS) (Washington Administrative Code [WAC] 173-204-500[5][b][iii]), the potential for an uncontrolled source in the landfill should be assessed.

Because the highest current PCB concentrations are not higher than those found at the time of the ROD and are limited to the immediate vicinity of station MA-09, the 2017 investigation report recommended not reopening the risk assessment regarding PCBs in sediment until additional PCB concentration trend data are available.

Based on the Preliminary Assessment for Per- and Polyfluoroalkyl Substances (PFAS PA; DON 2020b), PFAS was detected in groundwater samples collected at the OU 1 Landfill during supplemental RI activities. The recommendation of the PFAS PA was to move PFAS directly to the RI phase because the site is a former landfill and the presence of PFAS had already been determined. Therefore, PFAS was added to the ongoing supplemental RI as a COPC. PFAS compounds were analyzed in groundwater samples from 10 monitoring wells within identified hot spots. Of the ten monitoring wells, one or more PFAS compounds were detected in five monitoring wells (MW1-48, MW1-5, MW1-57, MW1-58, and MW1-60). None of the detected PFAS compound concentrations exceeded the project action limit (PAL), and all were much lower than the EPA lifetime health advisory that was applicable at the time of the assessment.

Recent investigations have identified contaminant hot spots within southern and southeastern areas of OU 1, as described in this SAP.

10.4 Land Use Considerations

The current land use in the vicinity of OU 1 is light industrial. Hazardous waste operations have been conducted in Building 1051 east of the landfill since 1995. Prior to that time, hazardous waste operations were conducted in Building 884 in the southeast portion of the landfill.

Following the implementation of the phytoremediation plantations, the landfill area between the two plantations was resurfaced with upgraded pavement and storm drainage as part of the landfill cover maintenance requirement. This area is used for parking, laydown and temporary staging of equipment and parts, and as a motorcycle training course.

No hazardous materials are stored in this area and there is no plan to use the landfill for permanent building structures. Below ground installations and permanent, full-time-occupancy buildings are prohibited due to the presence of cVOCs and methane gas in the landfill. With the exception of equipment storage and motorcycle training classes, no tenant command uses the land at OU 1.

The institutional controls include land use restrictions that prevent the installation of water wells on DON property within 1,000 feet of the landfill (except for monitoring wells or wells that may be needed for remedial actions).

10.5 Problem Definition Summary

10.5.1 Nature and Extent of Contamination

Historically, two classes of contaminants have been identified as COCs for OU 1, Area 1: chlorinated aliphatic hydrocarbons (a class of VOCs) and PCBs. The semi-volatile organic compound (SVOC) 1,4-dioxane was added to the LTM program as an emergent contaminant for the site, based on detection at the site, as recommended in the results of the Third Five-Year Review (DON 2010). VOCs were identified as COCs because of risks to future onsite, and current and future offsite, residential users of groundwater. PCBs were identified as COCs due to their potential to bioaccumulate, possibly impacting the seafood ingestion pathway from future seafood harvesting in the tide flats and Dogfish Bay (DON 2015a). VOCs in the North Plantation remain in the upper aquifer above RGs but are generally exhibiting de-chlorination with stable or decreasing concentration trends. However, new data evaluating the contaminant concentrations and nature and extent in groundwater has recently been collected during multiple field events between 2017 and 2022 as part of the supplemental RI. That information will be forthcoming in the future 2023 Supplemental Remedial Investigation Report.

VOC concentrations in South Plantation groundwater remain high, indicating the presence of a possible ongoing source area (or areas). VOCs also continue to be detected above RGs at a surface water sampling location and a seep water sampling location, downgradient of the landfill. Trace levels of PCBs in sediment, less than the RG, continue to be detected in the tide flats. While VOCs at these locations generally exhibit stable and decreasing concentration trends, PCB concentrations at two sediment locations MA-14 and TF-21 located between the North Plantation and the Tide Gate, although less than the RG, have exhibited an increasing trend during the past five years (DON 2015a).

Site investigations conducted between 2015 and 2019 also delineated the location, depth, and extent of site contaminants, which were found deeper than the existing LTM monitoring well network and farther south into the marsh south of the landfill (DON 2020a). The 2018 groundwater modeling study was conducted to inform risk decisions and update the existing CSM, and the 2019 Source Area Investigation Study was conducted to gather data to verify the migration path of 1,4-dioxane from the Central Landfill hotspots, to offsite locations, evaluate PCB contamination in site sediments, and better define the extent of contamination on the east side of the South Plantation, in the marsh area south/southeast of the South Plantation, and in Marsh Creek. Data from the 2019 investigations are currently being evaluated and will be used to update the existing CSM, map the regional aquitard contact within the site boundary, conduct fate and transport modeling, allow better evaluation of remedy effectiveness, and support a focused FS designed to evaluate alternatives for the treatment of identified hot spots to reduce the restoration timeframe at the site.

During initial work towards a numeric fate and transport model under the SAP for the 2019 investigation, it became clear that understanding the temporal variation in the freshwater/saltwater interface as it affects contaminant transport from groundwater to surface water would contribute substantially to the CSM. A more detailed understanding of the freshwater/saltwater interface within the wetland areas is also necessary to provide a comprehensive description of the environments for use in upcoming human health and ecological risk assessments (being performed under separate contract). Additionally, data collected under this SAP will be used to support the HH/ERA performed under a separate contract by others. A separate report has been prepared covering the geophysical investigation conducted to gather data regarding the freshwater/saltwater interface (DON 2020a). The planned geophysical investigation was also leveraged to collect stratigraphic information in support of an environmental sequence stratigraphy evaluation being performed as part of the geologic interpretation under separate contract.

The 2019 investigation revealed an apparently localized area of the northern landfill with PCB concentrations in shallow soil up to 210 milligrams per kilogram (mg/kg), which is two orders of magnitude above the State of Washington Model Toxics Control Act (MTCA) Method A Soil Cleanup Level of 1 mg/kg. These PCB concentrations in shallow soil were found approximately 100 feet inland (east) of seep SP1-1, which has exhibited post remedial action PCB concentrations in seep water in the range of not detected at 0.010 micrograms per liter (µg/L) to 0.57 µg/L (estimated) (DON 2020a) compared to an RG of 0.044 µg/L. The remedial action objective (RAO) from the OU 1 ROD regarding

PCBs is to "Prevent unacceptable risks to humans through ingestion of seafood and aquatic organisms because of sediment exposure by removing from the marsh sediment containing PCBs."

The third and fourth five-year reviews (DON 2010, 2015a) documented that RGs had been met for PCBs in shellfish tissue, and therefore this RAO had been met. However, the fourth five-year review also acknowledged that the subsistence fisher exposure assumptions had changed since the RGs were developed, and that new risk-based screening levels should be developed. In addition, the fourth five-year review noted an apparent increasing trend in PCB concentrations in seep water at seep location SP1-1 over the preceding five years. Because PCB results at location SP1-1 showed an increase in 2014 and sediment PCB trends at MA-14 and TF-21 increased during the 2015 sampling round, the fourth five-year review recommended additional sampling of sediment around the seep, and more frequent monitoring of the seep water. These data were to be used to assess PCB concentration trends and to assess whether recontamination, as specified in the SMS, was occurring. Decisions were to be made as to whether ongoing PCB monitoring should be initiated, and risk assumptions reviewed.

In response to the five-year review recommendations and the new hydrogeology and contaminant transport information revealed by the results of the additional investigation data from 2017 and 2019, the DON initiated a revision of the risk assessment for OU 1, conducted under a separate contract. Initial risk assessment planning has identified nine distinct Exposure Areas. This SAP covers investigations to support risk assessment planning for Exposure Areas 2 and 7, as depicted on Figure 3.

Regarding Exposure Area 7, the focus of the RAOs and the five-year review recommendations has consistently been to monitor the reduction of PCB concentrations in sediment and seep water, which would mitigate potential risks associated with the shellfish ingestion pathway. LTM PCB sediment results in this area have been variable, making it difficult to establish meaningful trend analysis. This SAP also describes ISM sampling of sediment within Exposure Area 7 to obtain a robust and reproducible measure of mean PCB concentrations within this area. These data will be used to establish a baseline against which potential recontamination can be measured and to assess PCB concentration trends in the vicinity and downgradient of the seep. The mean concentrations derived from ISM sediment sampling can also be used to support the risk assessment by providing an additional measure of PCB concentrations in sediment and to help assess risk from exposures within this area. ISM sediment sampling will be performed at eight decision units (DUs) depicted on Figure 6.

Although not listed as a COC in the ROD (DON, EPA, and Ecology 1998), the presence of PFAS as a COPC has been confirmed in groundwater at hot spots identified across the landfill. Sampling for PFAS is being conducted under separate contract. The data will be evaluated by the Supplemental RI contractor, Battelle, to determine the nature and extent of PFAS contamination in groundwater at the landfill.

COPCs have not been detected above RGs in the deep aquifer wells included in the long-term monitoring program, including the Department of Transportation (DOT) Well and Navy Well #5.

It should be noted that nature and extent are currently being re-evaluated and updated as part of the supplemental RI being conducted under separate contract by others. Data collected under this SAP will be used in the supplemental RI.

10.5.2 Project Action Limits

Tables 15-1 through 15-4 present current project action limits (PALs). These PALs are based on current regulatory criteria and PFAS screening levels and will be used for comparison to sample results addressed in this SAP. Note that data to be collected under this SAP will be used in the supplemental RI and HH/ERA Addendum being conducted by others, so data may also be compared to additional screening levels by these contractors.

Note that the RGs for OU 1 presented in the ROD (DON, EPA, and Ecology 1998) are based on the regulatory criteria at that time for the protection of drinking water and surface water bodies at and downgradient of the former landfill. Because 1,4-dioxane was not specified as a COC in the ROD, no RG was established. However, to allow for data evaluation, the results of 1,4-dioxane analyses will be compared to the MTCA Method B risk based cleanup level (carcinogenic) for 1,4-dioxane. This cleanup level was reduced by Ecology in August 2010 from 4.4 to 0.44 µg/L.

10.5.3 Potential Exposure Pathways

VOCs were identified as COCs because of risks to future onsite, and current and future offsite, residential users of groundwater. PCBs were identified as COCs due to their potential to bioaccumulate, possibly impacting the seafood ingestion pathway from future seafood harvesting in the tide flats and Dogfish Bay (DON 2015a). It should be noted that potential exposure pathways are currently being re-evaluated and updated as part of the supplemental RI and HH/ERA addendum conducted under separate contracts by others. Data collected under this SAP will be used in these efforts.

10.5.4 Remedial Action Objectives

RAOs specified in the OU 1 ROD (DON, EPA, and Ecology 1998) for the former base landfill (OU 1, Area 1) are:

- Prevent exposures to humans due to dermal contact with or ingestion of soil or waste material within the landfill that contains contaminants that may result in unacceptable risk. For this objective, unacceptable risk is defined as exposure of humans to concentrations of landfill contaminants above state cleanup levels for soil (MTCA Level B).
- Prevent exposures to humans due to inhalation of vapor from the landfill that contains contaminants that my result in unacceptable risk. For this objective, unacceptable risk is defined as exposure of humans to concentrations of landfill contaminants above state cleanup levels for air (MTCA Level B).
- Prevent exposures to humans due to drinking water ingestion of groundwater that contains landfill contaminants at concentrations above state and federal drinking water standards and state cleanup levels for groundwater (MTCA Level B).
- Prevent unacceptable risks to humans and aquatic organisms due to migration of landfill contaminants via groundwater into the adjacent aquatic environments, as defined in the RAOs discussed below for surface water.
- Prevent exposures to humans due to ingestion of seafood that contains contaminants at concentrations that pose unacceptable risk, as a result of chemicals migrating from the landfill via groundwater into the adjacent marine water. For this objective, unacceptable risk is defined as exposure of seafood resources to concentrations of landfill contaminants in surface water above state water quality standards, federal water quality criteria, and state cleanup levels for surface water (MTCA Level B). This refers to those surface water criteria and standards developed for the protection of human health (i.e., seafood ingestion).
- Prevent exposures to aquatic organisms due to contaminants present in surface water at concentrations that pose unacceptable risk, as a result of chemicals migrating from the landfill via groundwater into the adjacent surface water. For this objective, unacceptable risk is defined as concentrations in surface water above state water quality standards or federal water quality criteria developed for the protection of marine organisms.
- Prevent exposures to humans due to ingestion of seafood that contains contaminants at concentrations that pose unacceptable risk, as a result of chemicals migrating from the landfill via groundwater into the sediments of the adjacent aquatic systems and thence into seafood tissues. For this objective, unacceptable risk is defined as concentrations in littleneck clam tissues as defined in the seafood ingestion RAO discussed below for shellfish.
- Prevent exposures to aquatic organisms due to contaminants present in sediments at concentrations that pose unacceptable risk, as a result of chemicals migrating from the landfill via groundwater into the adjacent aquatic systems. For

this objective, unacceptable risk is defined as concentrations in sediments above state sediment quality standards for chemistry and bioassays.

- Prevent exposures to humans due to ingestion of seafood that contains contaminants at concentrations that pose unacceptable risk, as a result of chemicals migrating from the landfill via groundwater into the adjacent aquatic systems. For this objective, unacceptable risk is defined as concentrations in littleneck clam tissues above a cumulative incremental cancer risk of 10^{-5} or a noncancer hazard index of 1.0, using exposure assumptions for subsistence harvesters as identified in Appendix B of the ROD. These risk levels are within EPA's acceptable risk range, which refers to an incremental cancer risk of 10^{-6} to 10^{-4} and a noncancer hazard index of 1 as acceptable targets for Superfund sites. The risk levels are also in accord with the risk assessment framework used in MTCA to establish state cleanup levels for exposures to multiple hazardous substances (WAC 173-340-708). MTCA does not establish cleanup levels that are specific for shellfish samples.
- Prevent exposures of aquatic organisms to contaminants migrating from the landfill that pose unacceptable risk. For this objective, unacceptable risk is defined as concentrations of landfill contaminants in littleneck clams above the ecological risk-based screening values (i.e., the maximum acceptable tissue concentrations).

10.5.5 Remedy Components and Implementation

The LTM program at OU 1 involves periodic sampling and analysis of groundwater, surface water, seeps, sediments, and marine tissue (clams). It also involves periodic measurement of water levels to monitor the groundwater flow direction. However, LTM has been postponed at OU 1, Area 1 pending site characterization and pilot testing efforts under separate contracts. The sampling effort under this SAP will be performed in support of those characterization efforts and will include groundwater and sediment sampling.

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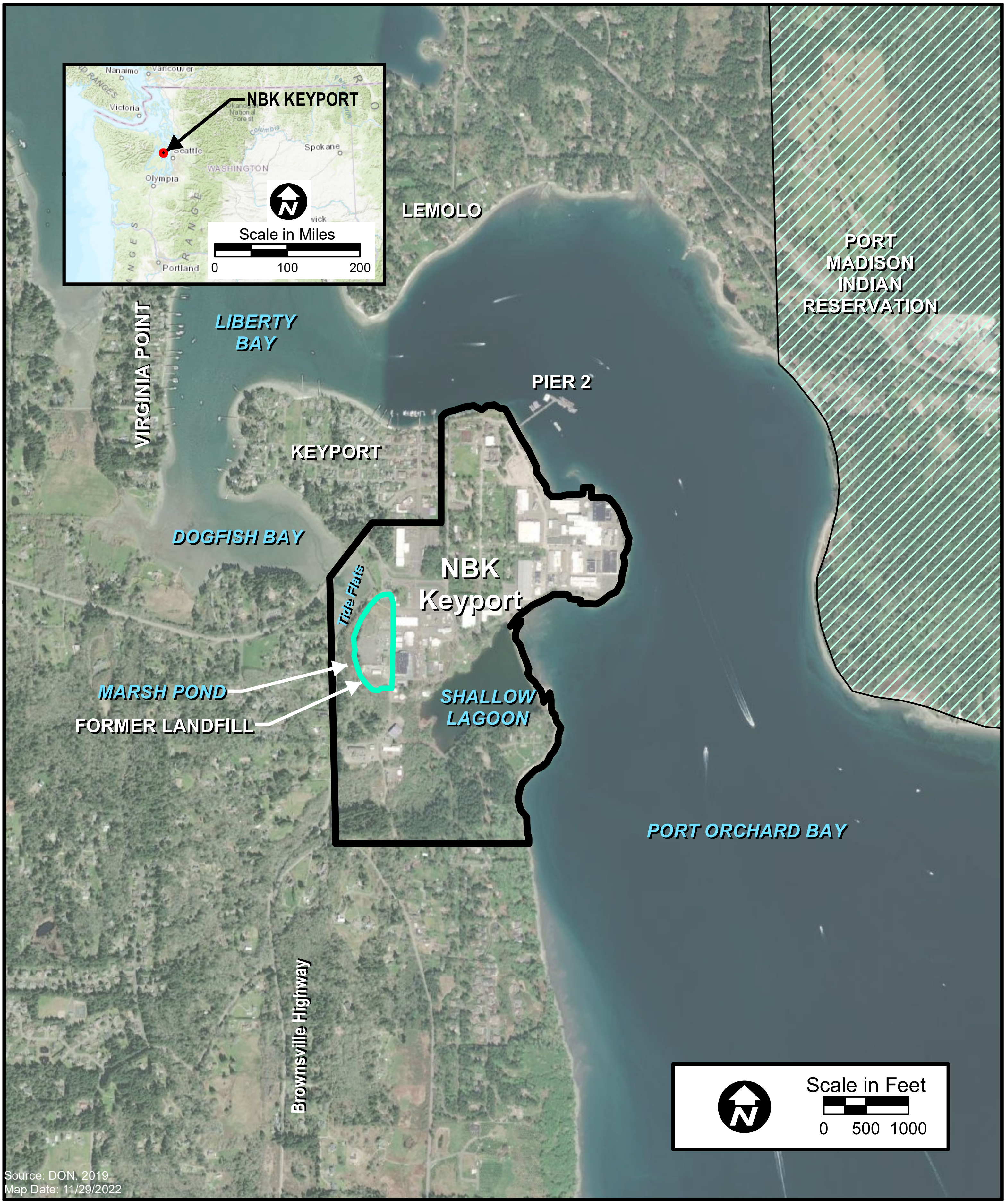

Source: DON, 2019
Map Date: 11/29/2022

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Figure 1
Naval Base Keyport
Vicinity Map

Sampling and Analysis Plan
Operable Unit 1,
Area 1 Former Landfill
TO N44255-22-F-4065

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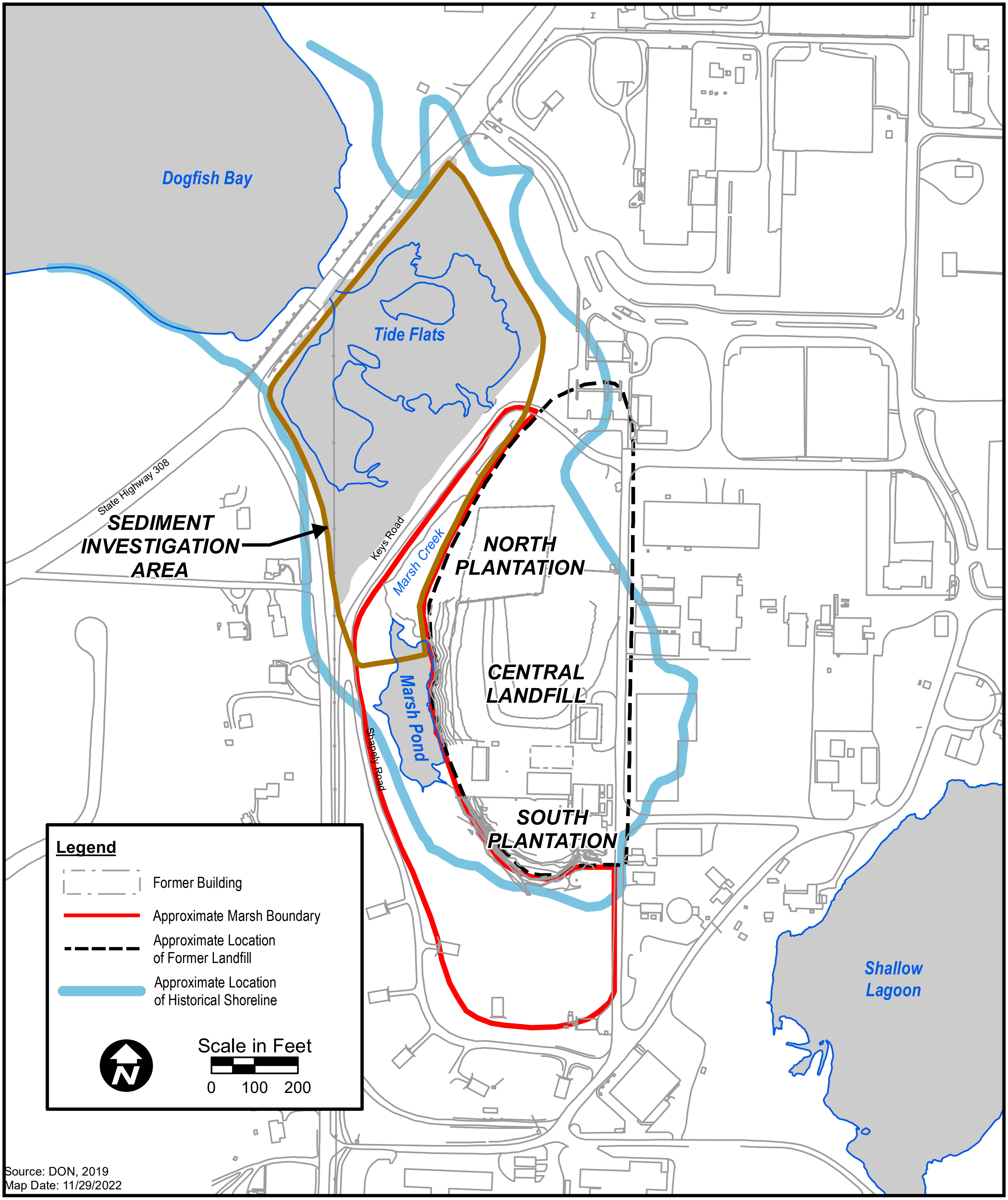

Source: DON, 2019
Map Date: 11/29/2022

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Figure 2
OU 1 Site
Layout Map

Sampling and Analysis Plan
Operable Unit 1,
Area 1 Former Landfill
TO N44255-22-F-4065

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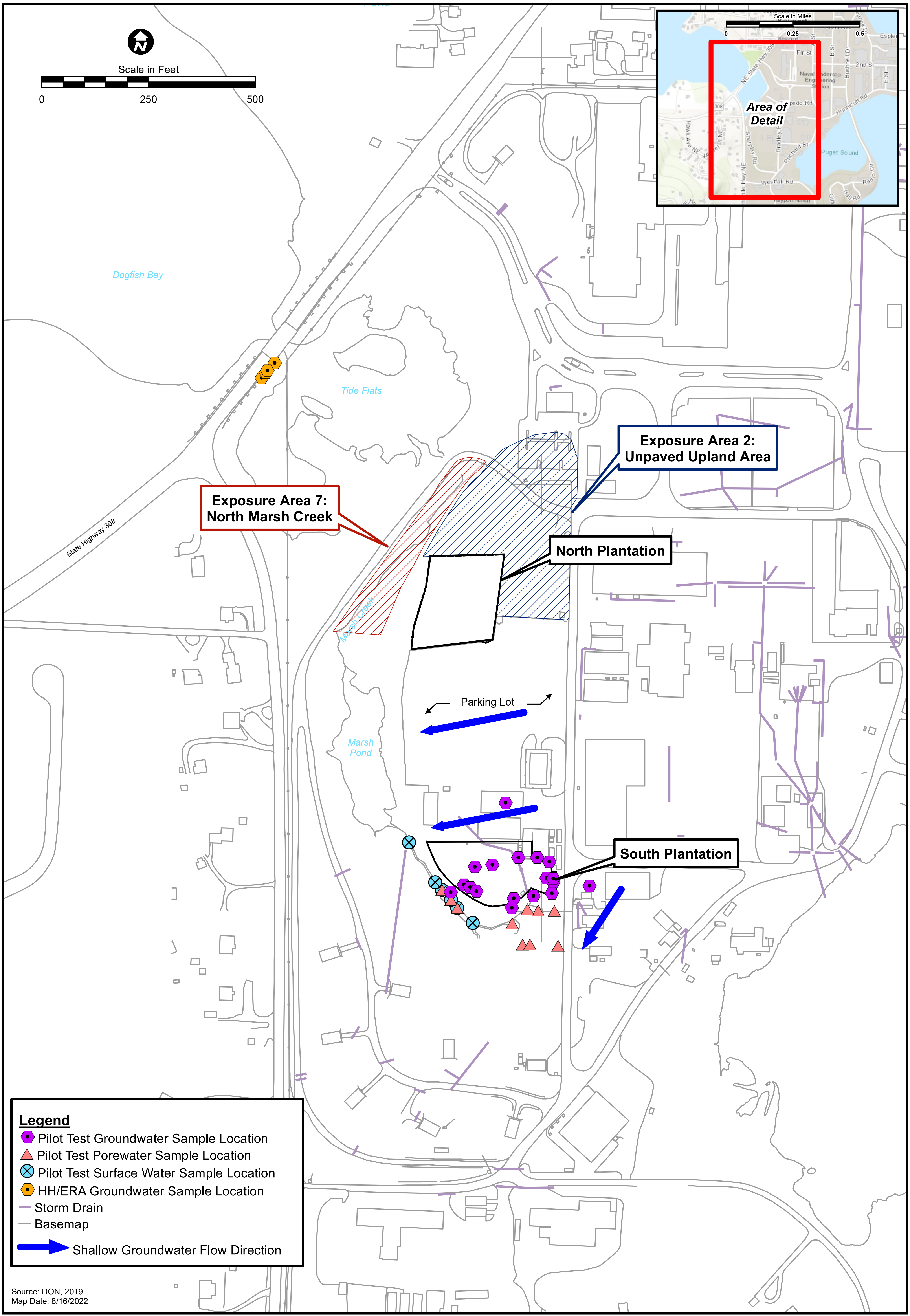

Source: DON, 2019
Map Date: 8/16/2022

Naval Facilities Engineering Systems Command

Figure 3
OU 1 Sampling Locations

Sampling and Analysis Plan
Operable Unit 1,
Area 1 Former Landfill
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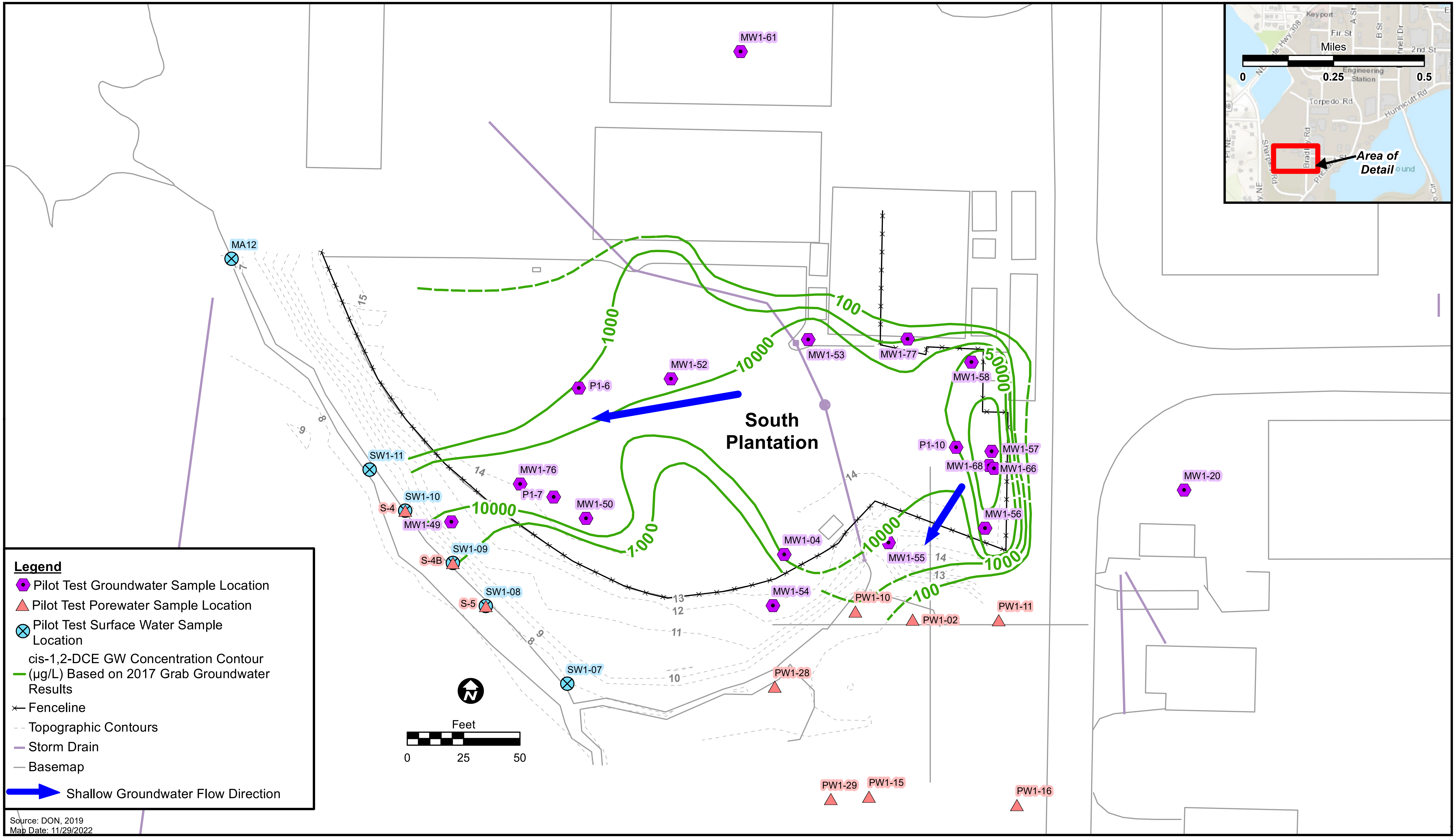

Source: DON, 2019
Map Date: 11/29/2022

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Figure 4
South Plantation Sample Locations

Sampling and Analysis Plan
Operable Unit 1,
Area 1 Former Landfill
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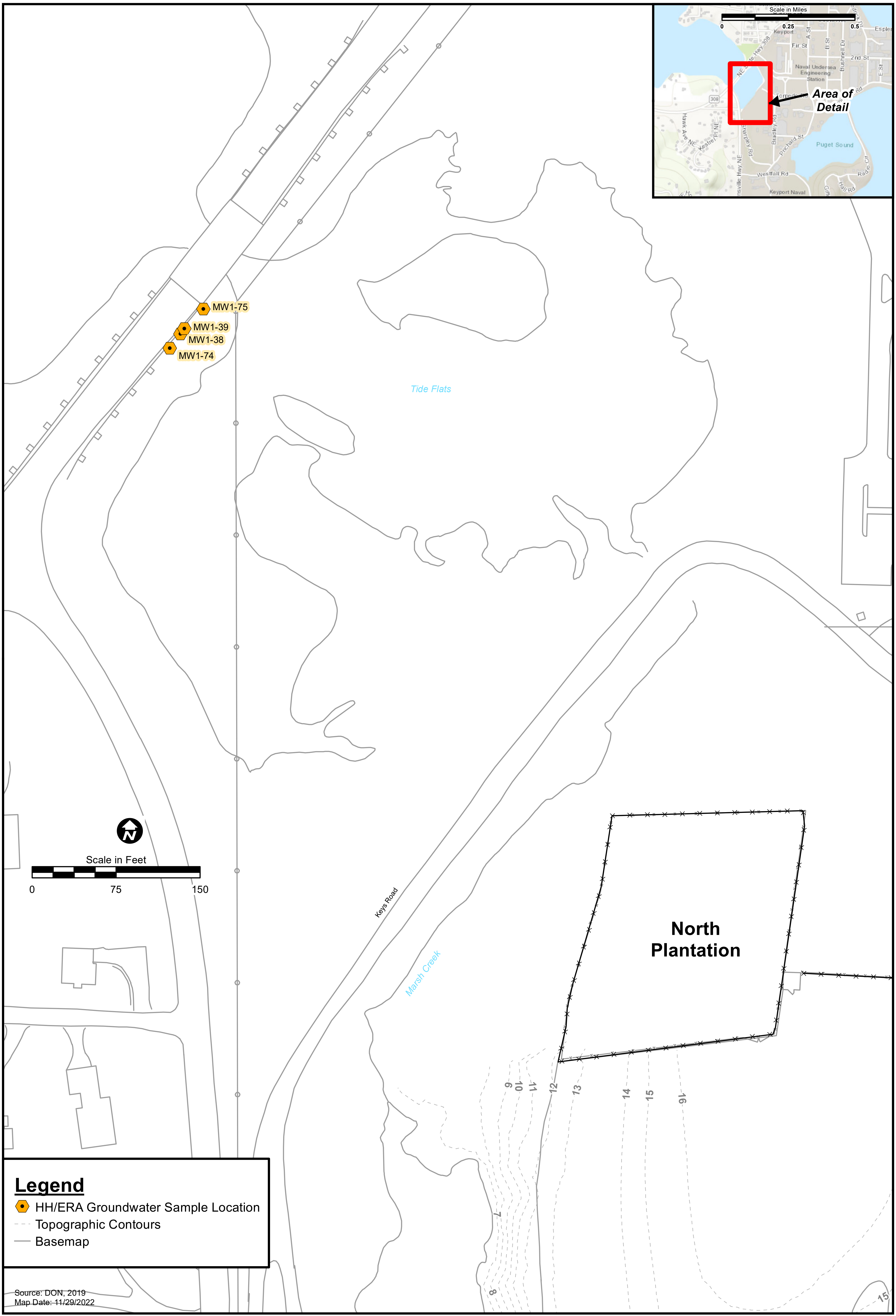

Source: DON, 2019
Map Date: 11/29/2022

NAVFAC
Naval Facilities Engineering Systems Command

Figure 5
Causeway Sampling Locations

Sampling and Analysis Plan
Operable Unit 1,
Area 1 Former Landfill
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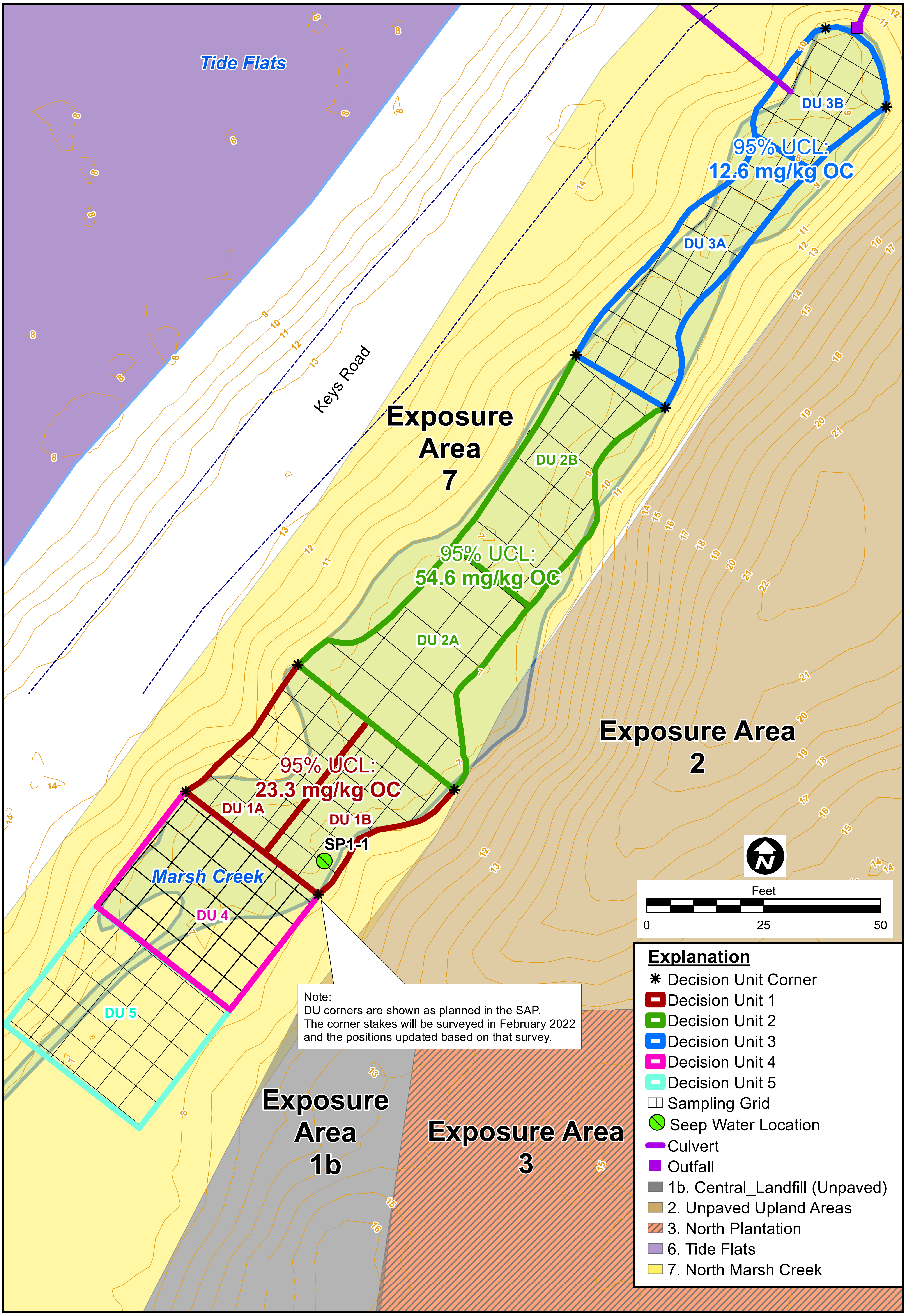

Note:
DU corners are shown as planned in the SAP.
The corner stakes will be surveyed in February 2022 and the positions updated based on that survey.

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Figure 6
Exposure Area 7 Decision Units

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SAP Worksheet #11: Data Quality Objectives/Systematic Planning Process Statements

Data quality objectives are an integrated set of qualitative and quantitative decision statements that define data quality requirements based on the end use of the data. EPA has developed a seven-step process to clarify study objectives, define the appropriate type of data, and specify acceptable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

Step 1. Problem Statement

This step identifies the issues to be addressed.

HH/ERA

Additional groundwater monitoring data is needed to support the on-going HH/ERA Addendum. Sampling support consisting of the collection of groundwater for VOCs (including cVOCs), metals, PAHs, PCB Aroclors, 1,4-dioxane, and PFAS at causeway monitoring wells is proposed.

The objective of this SAP is to provide groundwater data to support the evaluation of risk at OU 1; the problem statement from the Project-Specific QAPP, Keyport OU 1 Human Health and Ecological Risk Assessment is as follows (DON, 2021b):

- Are site-related contaminants present in OU 1 media at concentrations that pose potential unacceptable current or future risk to exposed human or ecological receptors?

PCB Source Investigation

Based on the results of DU sampling in 2021, refinement of the DUs is needed to provide a baseline against which equivalent future sampling results can be compared to assess whether recontamination is occurring as a result of seep discharge. Source investigation support consisting of sediment sampling of eight DUs and analysis for PCB congeners using ISM:

- What are the 95 percent upper confidence level concentrations of PCBs in sediment within each DU? This information is needed in order to serve as a baseline against which equivalent future sampling results can be compared to assess whether recontamination is occurring as a result of seep discharge and to support the risk assessment by providing an additional measure of PCB concentrations in sediment in the area.

Step 2. Decisions to be Made

The principal study questions for this project are as follows:

HH/ERA:

What are the COC and COPC concentrations in groundwater at the causeway? Note that the data will be collected to support the principal study question from the Project-Specific QAPP, Keyport OU 1 Human Health and Ecological Risk Assessment, which is as follows (DON, 2021b):

1. Do potential site-related human health or ecological risks exceed PALs presented in Table 15-3?

PCB Source Investigation

1. Establish the 95 percent upper confidence level mean concentrations of PCBs in the biologically active zone (0-10 centimeters [cm]) of sediment within each DU, which will be used as a baseline against which potential recontamination can be measured.
2. Do sediment concentrations within each DU exceed PCB PALs presented in Table 15-4?

Step 3. Inputs to the Decision

The following data and information addressed in this SAP will be provided to others to serve as the basis for making the decisions:

- Chemical data for groundwater samples collected in support of the HH/ERA.
- Chemical data for sediment samples using ISM from eight DUs in support of the PCB Source Investigation.
- PALs presented in Tables 15-1 through 15-4.

Step 4. Define the Boundaries of the Study

Detailed location maps for locations to be sampled are included as Figures 3 through 5.

HH/ERA

The general site location is shown on Figure 1. The spatial boundary is the causeway monitoring wells, which are located along the southeast shoulder of State Highway 308 and are depicted on Figure 5.

PCB Source Investigation

Although samples will be collected at low tide, the spatial boundaries of each DU will encompass the entire area represented by bank-to-bank inundation during high tide and DUs will be distributed vertically from the point where the stream channel narrows substantially, just upstream of seep SP1-1, to the tide gate (Figure 6). The temporal boundary will be a snapshot in time at the time of sampling, which will allow comparison to sample results collected in an equivalent manner in the future.

Step 5. Decision Rules

The process or “rules” for making the decisions listed under Step 2 are described in this section. Rules include how field decisions will be made, as well as how data will be interpreted.

HH/ERA

Groundwater data is planned for collection from causeway monitoring wells in order to support the decision rules from the Project-Specific QAPP, Keyport OU 1 Human Health and Ecological Risk Assessment. Decision rules from the Project-Specific QAPP, Keyport OU 1 Human Health and Ecological Risk Assessment, include (DON, 2021b) the following:

Assess HH/ERA by comparing groundwater sample results for causeway monitoring wells to PALs; the assessment will be performed as specified in the Risk Assessment Work Plan (DON 2022c).

PCB Source Investigation

If the 95 percent upper confidence limit concentration of PCB congeners calculated for each DU by following the Interstate Technology and Regulatory Council (ITRC) decision guidance for calculation of standard deviation between replicates performing the calculation of the mean shows detectable concentrations of PCB congeners, then establish these concentrations as baseline concentrations for comparison to future results and for trend analysis. If PCBs are not detected then the baseline concentration for comparison to future results and trend analysis will be established as zero, with a requirement for future laboratory results to achieve similar limits of detection as those by the initial analytical laboratory.

Step 6. Acceptable Limits on Decision Error

Decision error will be limited by managing the error in the data used to derive the decision by adhering to the precise limits on quantitative analytical data error provided in Worksheet #12 (Field Quality Control Samples), Worksheet #15 (Reference Limits and Evaluation Table), and Worksheet #28 (Analytical QC and Corrective Action).

In this section, potential sources of study error are identified, and methods to minimize these potential errors throughout the investigation are described. Specifically, this section:

- Identifies potential sources of study error (i.e., field error, analytical error, fundamental error due to compositional heterogeneity, grouping and segregation error due to distributional heterogeneity);
- Describes methods for reducing the potential for error; and
- Describes methods for managing decision errors.

Sources of error in an investigation can be divided into two main categories: sampling errors and measurement errors. Sampling error can occur as a result of sampling design and implementation that do not account for the range of heterogeneity at the site. Measurement error can occur as a result of performance variance from laboratory instrumentation, analytical methods, and operator error. The EPA identifies the combination of these errors as a “total study error” (EPA 2012). One objective of the long-term monitoring is to reduce the total study error so that decision makers can be confident that the data generated during the studies accurately represent the chemical concentrations at the site.

The investigation will use the following methods to minimize decision error potentially associated with sampling design, sampling methodologies, and laboratory analysis of COCs:

- Evaluate the available historical data to identify COCs, sampling locations, and site characteristics.
- Apply standardized field sampling methodologies. Sampling activities will be performed in accordance with the NAVFAC Northwest Standard Operating Procedure: NAVFAC Northwest Field Procedures Manual (2019) as well as the standard operating procedures (SOPs) and Field Procedures (FPs) referenced in Worksheet #21 and presented in Appendix C.
- Ensure that competent analytical laboratories accredited by the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and Ecology use appropriate methods for sample analysis, with one exception. No laboratory currently has Ecology accreditation for PFAS by EPA Draft Method 1633; DoD ELAP accreditation is deemed acceptable for this project since the accreditation process is rigorous. The documentation of the accreditation of the selected laboratories is presented in Appendix A. Laboratory SOPs are provided in Appendix B.

- Identify and control potential laboratory error and sampling error through the use of spikes, blanks, and field replicates. The analytical data will be evaluated by comparing relative percent difference or relative standard deviation between replicate sample results.

Step 7. Optimize the Design

The sampling design has been optimized by performing sampling and analysis as specified in this SAP, including using discrete sampling to support the HH/ERA and ISM sampling for support of the PCB Source Investigation. The sampling design is intended to be consistent with related SAPs completed under separate contracts (DON 2021a and 2021b). Details of the sampling design are presented in Worksheets #14, #17, and #18.

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SAP Worksheet #12: Field Quality Control Samples

This worksheet provides the measurement performance criteria for field QC samples. Matrix spike samples are included because additional volume (up to three times) will be collected in the field for these laboratory QC samples.

Table 12-1. Field Quality Control Samples for Human Health/Ecological Risk Assessment – Groundwater

QC Sample	Analytical Group	Frequency	DQIs	Measurement Performance Criteria	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Field duplicate	cVOCs, SVOCs (1,4-dioxane and PAHs), PCB Aroclors, metals, and PFAS	once[1]	Precision-Overall	RPD ≤50% for results ≥ LOQ for both primary and field duplicate samples	S
MS/MSD	cVOCs, SVOCs (1,4-dioxane and PAHs), PCB Aroclors, metals, and PFAS	once[1]	Precision, Accuracy	Presented in Worksheet #28	S&A
Equipment rinsate blank	cVOCs, SVOCs (1,4-dioxane and PAHs), PCB Aroclors, metals, and PFAS	once[1, 2]	Accuracy	No analyte > ½ LOQ (> LOQ for common laboratory contaminants) or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater	S&A
Field blank	PFAS	once[1]	Accuracy	No analyte > ½ LOQ (> LOQ for common laboratory contaminants) or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater	S&A
Trip blank	cVOCs and PFAS	1 per cooler	Representativeness, contamination	No analyte > ½ LOQ (> LOQ for common laboratory contaminants) or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater	S&A

Notes:

[1] Groundwater samples from four wells will be collected in one event; thus, a frequency of once is appropriate.

[2] Equipment rinsate blank is required at the specified frequency when non-dedicated sampling equipment is used (e.g., submersible pump for groundwater sampling). An equipment rinsate blank is not required when a peristaltic pump (which does not come in contact with the sample), and dedicated tubing are used for sample collection.

cVOC = chlorinated volatile organic compound
DQI = data quality indicator
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
PFAS = per- and polyfluoroalkyl substances
QC = quality control
RPD = relative percent difference
SVOC = semi-volatile organic compound

Table 12-2. Field Quality Control Samples for PCB Source Investigation – Sediment

QC Sample	Analytical Group	Frequency	DQIs	Measurement Performance Criteria	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
Field replicates[1]	PCB Congeners, Total Organic Carbon	1 duplicate and triplicate per primary sample	Precision-Overall	Percent RSD ≤50% for results ≥ LOQ for the primary and replicate samples	S
Equipment rinsate blank	PCB Congeners	1	Accuracy	No analyte > ½ LOQ (> LOQ for common laboratory contaminants) or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater	S&A
Source blank	PCB Congeners	1 per source of water used for decontamination of reusable sampling equipment that comes in contact with samples	Accuracy	No analyte > ½ LOQ (> LOQ for common laboratory contaminants) or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater	S&A

Notes:

[1] For each primary sediment sample, two replicates (i.e., a duplicate and triplicate) will be collected.

DQI = data quality indicator
LOQ = limit of quantitation
PCB = polychlorinated biphenyl
QC = quality control
RSD = relative standard deviation

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SAP Worksheet #13: Secondary Data Criteria and Limitations Table

Secondary Data	Data Source (originating organization, report title and date)	Data Generator(s) (originating organization, data types, data generation / collection dates)	How Data Will Be Used	Limitations on Data Use
Historical Site Information	NBK Keyport, OU 1, Record of Decision	DON, EPA, and Ecology, 1998	General information regarding the project areas; data will assist in developing project background	None
Phase II Investigation	Phase II Investigation reports from 2016 and 2017	DON, 2017 and 2018	General information regarding the project areas	None
Historical Site Information	Fifth Five-Year Review, Naval Base Keyport	DON, 2020a	General information regarding the project areas; data will assist in developing project background	None
2019 to 2021 Source Investigation	Unpublished data provided in interim deliverables covering 2019 to 2021 source investigations, ongoing	As indicated in DON, 2022a, data provided in interim deliverables covering 2019 to 2021 source investigations, ongoing	General information regarding project areas	None
Historical Site Information	2018 Groundwater Monitoring Report, OU 1 Naval Base Kitsap Keyport	DON, 2019b	General information regarding the project areas; data will assist in developing project background	None
Historical Site Information	2019 Groundwater Monitoring Report, OU 1 Naval Base Kitsap Keyport	DON, 2020c	General information regarding the project areas; data will assist in developing project background	None

Notes:
DON = Department of the Navy
Ecology = Washington State Department of Ecology
EPA = U.S. Environmental Protection Agency
NBK = Naval Base Keyport
OU = Operable Unit

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SAP Worksheet #14: Field Project Implementation

This worksheet describes major tasks associated with the following planned sampling events.

- HH/ERA – collect groundwater samples
- PCB Source Investigation – collect sediment samples using ISM

14.1 Mobilization Activities

14.1.1 Mobilization

The start of work will be coordinated with NAVFAC Northwest. Vehicle access routes to sampling locations will be identified before field activities occur. No significant traffic disruptions are anticipated. The FTL and SSHO will be onsite for each phase of fieldwork.

14.1.2 Health and Safety Kick-Off Briefing

On the first day of field activities for each phase of work, the SSHO will review the Health and Safety Plan (DON 2022b) with onsite project and subcontractor personnel. Special attention will be paid to emergency response procedures and site-specific protocol to ensure that personnel are aware of the applicable precautions and procedures. The SSHO will also verify that field personnel have evidence of proper and current training (e.g., 29 CFR 1910.120 OSHA 40-hour and 8-hour annual refresher training, etc.) prior to the start of field work. In addition, brief health and safety meetings will be held at the beginning of each workday throughout the duration of the field work. The SSHO will monitor field activities of project and subcontractor personnel.

14.1.3 Assessment / Audit Tasks

The PQCM will be responsible for assessment and audit tasks in coordination with the FTL. The TOM will be responsible for coordinating the field audit.

14.2 Field Equipment Calibration, Measurement, and Sampling

Field equipment calibration, measurements, and sampling will be performed in accordance with the SOPs and FPs listed in Worksheet #21. FPs are provided in Appendix C. A summary of field equipment calibration, measurement, and sampling techniques for this project is summarized below.

14.2.1 Field Equipment Calibration

Prior to collecting field measurements, measuring and testing equipment used in the field will be calibrated in accordance with manufacturer specifications. Equipment of the proper type, range, accuracy, and precision to provide data compatible with the specified requirements and desired results will be used to record the field measurements. The responsibility for the calibration of field equipment and logging the results of the calibration rests with the individual performing the sampling. As applicable, instruments will be calibrated according to manufacturer recommended procedures prior to each day's sampling and checked (at a minimum) prior to sampling and at the end of each day.

Readings will be verified and recorded in the field logbook. Acceptable limits or ranges in calibration accuracy will follow the manufacturer specifications.

14.2.2 Groundwater: Gauging, Field Measurements, Purging, and Sample Collection Techniques

Monitoring wells will be opened and measurement of the depth to water will be taken in accordance with SOP-I-D-5 and FP2 using an electronic water level measuring device. A water level probe with 0.01 or 0.02-foot gradation will be used for the measurements.

Groundwater monitoring wells will be purged using a low-flow technique. Typically samples from shallow wells will be collected using a battery-powered peristaltic pump with dedicated or disposable polyethylene tubing, while samples from deeper wells will be collected, where appropriate, using a generator-powered submersible pump (e.g., GrundFos™ Redi-Flo 2). Bladder pumps may be used if installed at wells. A summary of groundwater sampling locations, sampling frequency, and required analyses is presented in Worksheet #18.

The SOPs and FPs associated with groundwater sampling are summarized in Worksheet #21 and presented in Appendix C. General considerations for the precautions needed when sampling monitoring wells for PFAS are presented in SOP 073. As indicated in FP4, a well is considered stable and ready for sample collection when the indicator parameters have stabilized for three consecutive readings, as follows, or three casing volumes have been removed.

- Within 10 percent for temperature, specific conductance, and salinity
- Within 0.2 units for potential hydrogen (Ph)
- Within 10 percent, or within 0.1 milligrams per liter (mg/L) for dissolved oxygen
- Within 10 percent, or less than 10 nephelometric turbidity units, for turbidity or less than 10 nephelometric turbidity units

- Within 10 millivolts for oxidation reduction potential

14.2.3 Sediment: Incremental Sampling Methodology

Sediment samples will be collected using ISM in accordance with SOP 057 as indicated and in general accordance with the *Incremental Sampling Methodology Update* (ITRC 2020). A summary of sampling locations and required analysis is presented in Worksheet #18.

DU boundaries will be marked based on the division of existing DUs (DUs 1, 2 and 3) and the addition of two new DUs (DUs 4 and 5), and a sampling grid will be created to collect sediment increments. At each DU, the sampling pattern will be generated using a random number generator for an X and Y axis number, creating a three-point pattern replicated in every grid cell of each DU. Surface sediment increments will be collected from a depth of approximately 0 to 10 centimeters at the center of each grid cell. Sediment increments will be collected using three coring tools (e.g., ASM, Inc. Soil Step Probes), one for the primary sample and one for each replicate sample. This probe will be inserted 10 centimeters into the sediment, which may equal three quarters of the sampling window on the probe depending on the size of the probe. Alternately, spoons or scoops may be used, such that three aliquots of equal mass are collected from each grid cell. The sample material will then be directly extruded into the appropriately-labeled sample container(s), or alternately into a temporary “holding” container (e.g., decontaminated 5-gallon bucket or aluminum pan) for each primary or replicate sample. Field experience has found that placing sample increments into the temporary “holding” container and then transferring the entire sample into the laboratory container is a better process to reduce spilling and prevent loss of fine materials.

Each sample will be represented by 30 increments and composited to one ISM sample. It is preferred that approximately 30 grams of sediment will be collected from each of the increments and combined in an appropriate container(s) for a total of approximately 900 grams so that the sample amount does not exceed 1,000 grams for ease in laboratory processing. However, it is noted that approximating 30-gram aliquots (900 grams total for the 30 increments for each sample) may not be feasible, depending on soil type and coring tool diameter. If multiple sample containers are necessary, the laboratory will be instructed to combine the contents of the provided containers. Field duplicate and triplicate samples will be collected from each grid that a primary sample is collected using a similar approach to obtain approximately 900 grams for each, if the preferred amount can be collected. Each sample (approximately 900 grams preferred) will be weighed in the field and recorded in the field logbook. Each sample container will be placed inside a plastic bag and adequately cushioned when placing in the cooler.

14.2.4 Sample Bottle Filling Procedure

Worksheet #19, Field Sampling Requirements Table, presents a summary of the sample container, preservation, and holding time requirements.

As applicable for HH/ERA groundwater, sample containers for PFAS will be filled first by pumping the water directly into the containers.

Generally, water sample containers for VOCs will be filled next to minimize agitation and aeration of water. The containers intended for VOC analysis will contain hydrochloric acid (HCl) to preserve the sample to below Ph of 2; do not overflow sample containers.

Generally, the following steps will be followed for filling the sample containers:

- Prior to filling the sample containers, don new clean gloves.
- Complete sample bottle label, making sure the information is correct.
- Open sample jar and add sample.
- If applicable, wipe the outside threads of the container. Cap the container.
- For VOC samples in an aqueous matrix, verify that there is zero headspace in the glassware after filling and capping.
- Dry the outside of containers after they are filled and place immediately in the cooler.

14.3 Sample Types and Identification

Samples to be collected during this project include groundwater from onsite monitoring wells and sediment.

Samples will be uniquely identified, labeled, and documented in the field at the time of collection. Each sample container must bear a label identifying the project, sample identification (ID), preservatives (if applicable), analytical parameter (or analyte), method, and the date and time at which the sample was obtained. For practical purposes, the most representative time of sampling will be designated as the sampling time, even though discrete sample containers may be individually filled over a more extended period of time.

The unique sample ID code will be:

XX-YY-Z Where:

XX = Event indicator (RA for HH/ERA or SI for PCB Source Investigation)
YY = Location indicator
Z = Sequential indicator, if needed

The unique sample ID and its corresponding sample location will be recorded on field documentation forms. A cross-reference will be kept in the field logbook that shows the sample ID, as well as the location where the sample was collected.

As required, field QC samples will be designated as follows:

- Field replicate samples will be designated with a unique sample ID as indicated above, using a sequential indicator, and the sample type will be recorded on field documentation forms.
- Equipment rinsate blanks will be designated as EB-MMDDYY (i.e., EB prefix then dash then six-digit date, such as EB-111522 for an equipment rinsate blank collected on 15 November 2022).
- Field blanks will be designated as FB-MMDDYY (i.e., FB prefix then dash then six-digit date, such as FB-111522 for a field blank collected on 15 November 2022).
- Trip blanks will be designated as TB-MMDDYY (i.e., TB prefix then dash then six-digit date, such as TB-111522 for a trip blank placed in a cooler on 15 November 2022).

Extra volume will be collected for MS/MSD sets for a particular sample and noted on the chain-of-custody record.

14.4 Sample Packing and Shipment

As indicated in Worksheet #21, protocols and procedures for sample packing and shipment are provided in SOP III-G and FP6, located in Appendix C.

14.5 Equipment Decontamination Techniques

Non-disposable field equipment will be decontaminated to minimize the potential for cross-contamination. Non-disposable field sampling equipment will be decontaminated prior to use and between each sampling activity. The general procedure will include washing with Liquinox™ (or equivalent) and potable water and rinsing with potable water, followed by an additional water rinse. Detailed instructions are provided in SOP-III-I and FP5 in Appendix C with PFAS-specific instructions provided in SOP 073.

Sampling equipment will be decontaminated between sample locations either directly at the sample location or at the primary decontamination area.

Decontamination water will be disposed of with purge water. The use of new and dedicated tubing and the collection of samples directly into sample bottles will minimize the need for decontamination.

At each sampling location, the sample team members will wear new or clean gloves. Gloves will be changed at the sampling location as needed.

14.6 Investigation Derived Waste

Decontamination wastewater and monitoring well purge water will be contained in drums stored in a DON-designated location or managed as directed by the Building 1051 installation waste manager/coordinator and as described in SOP-I-A-7 IDW Management. The contractor will follow Federal, State, and local laws as well as requirements of the transport, storage, and disposal facility. Waste characterization sampling will be coordinated with installation waste personnel and the DON will manage waste in accordance with existing DON waste management practices.

It is anticipated that one representative waste sample of wastewater generated during the sampling of existing monitoring wells will be collected for the following analyses and methods, which are subject to change based on disposal requirements:

<u>Wastewater:</u>

- Total cyanide by Method 9012B
- Sulfide by Method SM4500-S^{-2} F.
- Diesel and oil range organics by Method NWTPH-Dx
- Gasoline range organics by Method NWTPH-Gx
- Copper, nickel, and zinc by Method 6020B
- PCB Aroclors by Method 8082A
- Halogenated organic compounds by Method 8260D
- PAHs by Method 8270E or 8270E selected ion monitoring (SIM)
- Toxicity Characteristic Leaching Procedure (TCLP) metals (RCRA 8) by Methods 1311/6000 and 7000 Series
- Toxicity Characteristic Leaching Procedure VOCs by Methods 1311/8260D.

No field QC samples will be collected in association with the waste characterization samples.

Non-hazardous waste, including disposable personal protective equipment and material packaging, will be disposed of in the local municipal landfill or incinerator.

14.7 Field Documentation

Field activities will be documented in field logbooks and field forms to ensure that adequate records are compiled during the sampling process.

14.7.1 Field Logbook

The field logbook will be used to document sampling activities performed on site. Protocols for documenting field activities in the field logbook are provided in SOP III-D and FP7 located in Appendix C.

14.7.2 Water Sampling Log

A Well Inspection, Purging, and Field Measurement Form (presented in Appendix D) is prepared for each sample to record information pertaining to the collection of field measurements. The following information is required, as appropriate:

- Sampling location, depth-to-water measurement, and the amount of water purged from monitor wells
- Sampling method and sampling personnel
- Date and time of sample collection
- Sample observations and sample ID
- Field measurements.

14.7.3 Field Change Request Form

If unforeseen conditions beyond the Contractor’s control inhibit the collection of an environmental sample or field measurement, a Field Change Request (Appendix D) will be completed by the Contractor and submitted to NAVFAC Northwest. Unforeseen conditions include such instances as inadequate water volume, access limitations to sampling locations, or other conditions which may preclude sampling in accordance with the SAP. In those instances, upon concurrence with NAVFAC Northwest, an appropriate course of action will be determined.

14.7.4 Sample Custody/Tracking Forms and Procedure

The samples taken must be traceable from the time of collection until they are disposed of at the laboratory after completion of analysis. In order to maintain and document sample possession, the field custody procedures will be implemented as described in SOP III-E and SOP III-G.

14.7.5 Chain-of-custody Record

The chain-of-custody record (Appendix D) will be used to document sample collection and the analyses required for each sample. It documents the custody of each sample from its collection through transfers of custody until receipt by the analytical laboratory. The chain-of-custody record will be filled out as each sample is taken and double-checked before the samples are delivered to the laboratory as described in SOP III-E and SOP III-G.

14.7.6 Sample Container Labels

Sample containers will be labeled with the following information in waterproof black ink (PFAS free, as applicable) at the time of sampling according to SOP-III-E:

- Project name
- Sampling date and time
- Sample ID (refer to Section 14.3)
- Preservative used (if applicable)
- Initials of person sampling
- Analysis requested.

The sample label will be attached to the sample container as soon as the container is filled, and the lid is secured. The information on the sample label must match the information on the chain-of-custody record and field logbook for the individual sample.

14.7.7 Custody Seals

Custody seals will be attached to each sample container and on sample shipping containers (coolers) if delivery of samples to the laboratory will be provided by a commercial courier service (e.g., FedEx) because there is a reasonable chance that the coolers can be opened. If a local courier service is delivering samples, custody seals will be affixed on the outside of the coolers but not on each sampling container because they will not open the cooler. The sampler will sign or initialize and date the custody seals. The custody seals will be affixed on the outside of the sample coolers (front and side) so they cannot be opened without breaking the seals.

14.8 Demobilization

The field team will remove field equipment and supplies from the site upon the completion of field activities. The site will be restored to the original condition that existed prior to fieldwork as much as possible, although the installed monitoring wells will remain.

14.9 Laboratory Analysis

Samples will be analyzed by one or more laboratories accredited through the DoD ELAP and Ecology. As applicable, the accreditations must cover the test methods, analytes, and matrices performed for this project. One possible exception for this project is that currently no laboratory has Ecology accreditation for PFAS by EPA Draft Method

1633. The DoD ELAP accreditation process is very rigorous; thus, the lack of Ecology accreditation for PFAS by EPA Draft Method 1633 at this time is not a significant concern regarding. data quality and decision-making.

Laboratory analyses will be performed in accordance with requirements specified in the analytical methods and Quality Systems Manual for Environmental Laboratories (QSM) Version 5.4 (DoD 2021a). The contracted laboratories for sample analysis are identified in Worksheet #30. The laboratories' current accreditation status will be verified prior to issuance of the subcontracts for this project. Current accreditations are presented in Appendix A.

The Field Sampling Requirements Table (Worksheet #19) lists the analytes, preservation details, and holding times for required analyses.

The selected methods provide sufficiently low detection limits (detection limits [DLs], limits of detection [LODs], and limits of quantitation [LOQ]) needed to meet the PALs, except as otherwise indicated in Worksheet #15 (Reference Limits and Evaluation).

For sediment samples collected using ISM, the laboratory will be instructed to homogenize (mix) and subsample each of the samples; the primary, duplicate, and triplicate samples at each location will be handled as separate samples. If more than one container is provided for a sample, the laboratory will be instructed to combine the containers before homogenizing and subsampling.

14.10 Data Review, Data Validation, and Data Management

The following sections describe how data will be reviewed, validated, and managed.

14.10.1 Data Review Tasks

Upon receipt of the laboratory's deliverables, the Project Chemist or designee will perform a verification review of sample custody, receipt conditions, and holding times; and will perform a review of sample results (including detection limits and results for field replicates). The Project Chemist or designee will also review validation reports provided by the third-party validator that will be performing a review of laboratory and field QC data.

The Project Chemist will complete a Stage 2A data review for waste characterization data.

14.10.2 Data Validation

Laboratory data packages, with the exception of data associated with waste characterization sampling, will be validated by a third-party validation firm to evaluate data quality, as described in Worksheet #36. Laboratory data packages will be validated in accordance with the documents listed in Worksheet #36. Laboratory data packages will be validated in accordance with the 2019 DoD General Data Validation Guidelines Stages 4 (minimum of 10% of the data) and 2B (remaining data) (DoD 2019) and associated modules.

The following documents will be used as guidelines for performing the validation:

- General Data Validation Guidelines (DoD 2019)
- Data Validation Guidelines, Module 1: Data Validation Procedure for Organic Analysis by GC/MS (DoD 2020)
- Data Validation Guidelines Module 5: Data Validation Procedure for Metals by ICP-MS (DoD 2022b)
- Data Validation Guidelines, Module 6: Data Validation Procedure for PFAS Analysis by QSM Table B-24 (DoD 2022c)
- Data Validation Guidelines, Module 4: Data Validation Procedure for Organic Analysis by GC (DoD 2021b)
- Data Validation Guidelines Modules 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination (DoD 2022a)
- National Functional Guidelines for High Resolution Superfund Methods Data Review (EPA 2020).

If new or updated DoD modules become available during this project, they may be used for data validation. The data will also be evaluated using criteria specified in the QSM Version 5.4.

14.10.3 Data Management

Data will be provided by the laboratory in hardcopy, Acrobat Adobe™ portable data format (PDF), and electronic format Navy Electronic Data Deliverable. The laboratory will provide fully documented data packages (Stage 4 as defined in the QSM Version 5.4 [DoD 2021a]) in hardcopy and PDF file format, which will include results for field samples, associated QC data, and raw data. The laboratory reports will be sent to a third-party data validation firm for validation after verification by the Project Chemist. The data validation report will include a summary of the reviewed items and a qualified data summary for each sample. The data validation report will be included with the summary report (discussed in the following section).

A copy of the summary report and the PDF laboratory report will be maintained in the contractor's project files. The electronic data deliverable will be submitted for archiving in DON's database. The hard copy data deliverable will be submitted directly to NAVFAC Northwest's document manager. The protocol for these submittals is included in the NAVFAC Northwest SOP: NAVFAC Northwest Field Procedures Manual and the online Navy SOP for Electronic Data Deliverables available (with an account) at the following website: https://niris.navfac.navy.mil/se/nirisportal.

14.11 Reporting

A summary report will be prepared after the completion of the field event and laboratory analyses and validation. The report will include the following information:

- Site description and history
- An illustrated map of the area with well and sampling locations
- Description of field activities and procedures
- Description of changes or field problems in the program, if any
- Results of field parameters and laboratory analysis in a tabular format with data validation reports containing laboratory results and field forms in an appendix
- A narrative description of compliance with proposed PALs for each target analyte
- Summary tables of analytical data
- AutoCAD drawings, or a like-type drawing, indicating the groundwater contours, flow direction and plume locations and concentrations; and
- Conclusions and recommendations.

The report will be provided in three iterations: internal draft, draft, and final.

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SAP Worksheet #15: Reference Limits and Evaluation Table

This worksheet serves to identify target analytes, PALs for target analytes, and the laboratory-specific LOQs, LODs, and DLs of the selected analytical laboratories for this project (Eurofins Seattle, ELLE, and Eurofins Sacramento), as presented in Tables 15-1 and 15-2.

Definitions for LOQs, LODs, and DLs are provided in Worksheet #37. Quantitative concentrations within specified limits of precision and bias can only be achieved at or above the LOQ; however, the laboratory may identify analytes between the DL and the LOQ as estimated values. The laboratory will report non-detectable sample results at the LOD, as described in the DoD QSM, Version 5.4 (DoD 2021a). Sample matrix effects or necessary sample dilutions may affect the sample-specific LOQ, LOD, and DL for project samples. Sediment sample results will be reported on a dry-weight basis.

For this project, it is anticipated that several LODs for non-detected analytes will be above the applicable PALs, as shown in Tables 15-1 and/or 15-2. At a minimum, the LODs in bold on these tables are above the applicable PALs. Sample-specific LODs for additional analytes may exceed PALs depending on dilutions or dry weight correction, as applicable. Non-detected analytes with an LOD above the PAL will not be considered to exceed PALs, and the data will be included for decision making. However, it is acknowledged that presence at a concentration below the LOD is a possibility.

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Table 15-1. Reference Limits for HH/ERA - Groundwater

Analyte	PAL[1] (µg/L)	PAL Reference[1]	Laboratory-Specific Limits (µg/L)[2, 4]			Laboratory
			LOQ	LOD	DL	
Chlorinated Volatile Organic Compounds (EPA SW-846 Method 8260D using Eurofins Seattle's low-level implementation)						
1,1,1-Trichloroethane	10,000	Surface water human health freshwater guidance (CWA)	0.20	0.070	0.025	Eurofins Seattle
1,1-Dichloroethane	8.9	Surface water human health freshwater guidance (CWA)	0.20	0.070	0.025	Eurofins Seattle
1,1-Dichloroethene	300	Surface water human health freshwater guidance (CWA)	0.20	0.070	0.035	Eurofins Seattle
1,2-Dichloroethane	8.9	Surface water human health freshwater guidance (40 CFR 131.45)	0.20	0.15	0.043	Eurofins Seattle
1,2-Dichloroethene (cis)	100	Surface water human health freshwater guidance (CWA)	0.20	0.15	0.055	Eurofins Seattle
1,2-Dichloroethene (trans)	100	Surface water human health freshwater guidance (CWA)	0.20	0.070	0.033	Eurofins Seattle
Ethyl chloride (Chloroethane)	8.9	Surface water human health freshwater guidance (40 CFR 131.45)	0.50	0.25	0.096	Eurofins Seattle
Tetrachloroethene	2.4	Surface water human health freshwater guidance (40 CFR 131.45)	0.50	0.25	0.084	Eurofins Seattle
Trichloroethene	0.30	Surface water human health freshwater guidance (40 CFR 131.45)	0.20	0.15	0.066	Eurofins Seattle
Vinyl chloride	0.020	Surface water human health freshwater guidance (173-201 WAC)	**0.100**	**0.090**	**0.040**	Eurofins Seattle
Semi-volatile Organic Compounds (EPA SW-846 Method 8270E using SIM)						
1,4-Dioxane	0.44	Groundwater MTCA B cancer	0.20	0.050	0.036	Eurofins Seattle
PAHs (EPA SW-846 Method 8270E using SIM)						
Acenaphthene	30	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE
Acenaphthylene	30	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE
Anthracene	100	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE
Benzo(a)pyrene	0.000016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.030**	**0.010**	ELLE
Benzo(a)anthracene	0.00016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.030**	**0.010**	ELLE
Benzo(b)fluoranthene	0.00016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.030**	**0.010**	ELLE
Benzo(g,h,i)perylene	8.0	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE

Analyte	**PAL[1] (µg/L)**	**PAL Reference[1]**	**Laboratory-Specific Limits (µg/L)[2, 4]**			**Laboratory**
			LOQ	**LOD**	**DL**	
Benzo(k)fluoranthene	0.0016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.030**	**0.010**	ELLE
Chrysene	0.016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.030**	0.010	ELLE
Dibenz(a,h)anthracene	0.000016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.040**	**0.020**	ELLE
Fluoranthene	6.0	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE
Fluorene	10	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE
Indeno(1,2,3-c,d)pyrene	0.00016	Surface water human health freshwater guidance (40 CFR 131.45)	**0.050**	**0.040**	**0.020**	ELLE
2-Methylnaphthalene	4,900	Surface Water MTCA B Noncancer	0.050	0.040	0.020	ELLE
Naphthalene	4,900	Surface Water MTCA B Noncancer	0.070	0.060	0.030	ELLE
Phenanthrene	100	Surface water human health freshwater guidance (40 CFR 131.45)	0.070	0.060	0.030	ELLE
Pyrene	8.0	Surface water human health freshwater guidance (40 CFR 131.45)	0.050	0.030	0.010	ELLE
Carcinogenic PAH TEQ	0.000016	Surface water human health freshwater guidance (40 CFR 131.45)	NA	NA	NA	ELLE (calculated)
PCB Aroclors (EPA SW-846 Method 8082A)						
Aroclor 1016	0.0030	Surface Water MTCA B cancer	**0.25**	**0.20**	**0.10**	ELLE
Aroclor 1221	None	None	0.25	0.20	0.10	ELLE
Aroclor 1232	None	None	0.25	0.20	0.10	ELLE
Aroclor 1242	None	None	0.25	0.20	0.10	ELLE
Aroclor 1248	None	None	0.25	0.20	0.10	ELLE
Aroclor 1254	0.00010	Surface Water MTCA B cancer	**0.25**	**0.20**	**0.078**	ELLE
Aroclor 1260	None	None	0.25	0.20	0.078	ELLE
Aroclor 1262	None	None	0.25	0.20	0.078	ELLE
Aroclor 1268	None	None	0.25	0.20	0.078	ELLE
Total PCB Aroclors	0.0000070	Surface water human health freshwater guidance (40 CFR 131.45)	**0.25**	**0.20**	**0.10**	ELLE (calculated)
Metals, Total (EPA SW-846 Method 6020B and 7470A)						
Antimony	5.6	Surface water aquatic life (CWA)	1.0	0.50	0.20	ELLE
Arsenic	0.018	Surface water human health freshwater guidance (40 CFR 131.45)	**2.0**	**1.7**	**0.68**	ELLE
Beryllium	270	Surface Water MTCA B cancer	0.50	0.30	0.12	ELLE
Cadmium	0.72	Surface water aquatic life (CWA)	0.50	0.40	0.15	ELLE

Analyte	**PAL[1] (µg/L)**	**PAL Reference[1]**	**Laboratory-Specific Limits (µg/L)[2, 4]**			**Laboratory**
			LOQ	**LOD**	**DL**	
Chromium	10	Surface water aquatic life fresh/chronic 173-201A WAC	2.0	0.80	0.33	ELLE
Lead	2.5	Surface water aquatic life fresh/chronic 173-201A WAC	0.50	0.20	0.071	ELLE
Manganese	50	Surface water human health freshwater guidance (CWA)	2.0	1.9	0.95	ELLE
Mercury	0.012	Surface water aquatic life fresh/chronic 173-201A WAC	**0.20**	**0.16**	**0.079**	ELLE
Nickel	8.2	Surface water aquatic life marine/chronic 173-201A WAC	1.5	0.80	0.40	ELLE
Thallium	0.22	Surface water fresh/marine	**0.50**	**0.30**	0.13	ELLE
Zinc	81	Surface water aquatic life marine/chronic 173-201A WAC	15	8.0	4.0	ELLE
PFAS (EPA Draft Method 1633)						
Perflurobutanoic acid (PFBA)	None	None	0.0064	0.0032	0.00094	Eurofins Sacramento
Perfluropentanoic acid (PFPeA)	None	None	0.0032	0.0016	0.00055	Eurofins Sacramento
Perflurohexanoic acid (PFHxA)	None	None	0.0016	0.0013	0.00045	Eurofins Sacramento
Perfluroheptanoic acid (PFHpA)	None	None	0.0016	0.0013	0.00050	Eurofins Sacramento
Perflurooctanoic acid (PFOA)	0.0060[3]	EPA RSL[3]	0.0016	0.00080	0.00037	Eurofins Sacramento
Perflurononanoic acid (PFNA)	0.0060[3]	EPA RSL[3]	0.0020	0.0016	0.00066	Eurofins Sacramento
Perflurodecanoic acid (PFDA)	None	None	0.0032	0.0024	0.00081	Eurofins Sacramento
Perfluroundecanoic acid (PFUnA)	None	None	0.0016	0.0013	0.00061	Eurofins Sacramento
Perflurododecanoic acid (PFDoA)	None	None	0.0016	0.0013	0.00060	Eurofins Sacramento
Perflurotridecanoic acid (PFTrDA)	None	None	0.0016	0.0013	0.00048	Eurofins Sacramento
Perflurotetradecanoic acid (PFTeDA)	None	None	0.0016	0.0013	0.00055	Eurofins Sacramento
Perflurobutanesulfonic acid (PFBS)	0.601[3]	EPA RSL[3]	0.0016	0.0071	0.00029	Eurofins Sacramento

Analyte	PAL[1] (µg/L)	PAL Reference[1]	Laboratory-Specific Limits (µg/L)[2, 4]			Laboratory
			LOQ	LOD	DL	
Perflurопentanesulfonic acid (PFPeS)	None	None	0.0016	0.0075	0.00035	Eurofins Sacramento
Perflurohexanesulfonic acid (PFHxS)	0.039[3]	EPA RSL[3]	0.0016	0.0012	0.00039	Eurofins Sacramento
Perfluroheptanesulfonic acid (PFHpS)	None	None	0.0016	0.0012	0.00040	Eurofins Sacramento
Perflurooctanesulfonic acid (PFOS)	0.0040[3]	EPA RSL[3]	0.0016	0.0012	0.00044	Eurofins Sacramento
1H,1H, 2H, 2H-Perfluorohexane sulfonic acid (4:2FTS)	None	None	0.0064	0.0048	0.0016	Eurofins Sacramento
1H,1H, 2H, 2H-Perfluorooctane sulfonic acid (6:2FTS)	None	None	0.0064	0.0030	0.0011	Eurofins Sacramento
1H,1H, 2H, 2H-Perfluorodecane sulfonic acid (8:2FTS)	None	None	0.0064	0.0031	0.0014	Eurofins Sacramento
N-methyl perfluorooctanesulfonoamidoacetic acid (NMeFOSAA)	None	None	0.0020	0.0016	0.00074	Eurofins Sacramento
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	None	None	0.0016	0.0013	0.00055	Eurofins Sacramento
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	0.0060[3]	EPA RSL[3]	**0.0064**	0.0051	0.0018	Eurofins Sacramento
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	None	None	0.0064	0.0048	0.0017	Eurofins Sacramento
Perfluoro-3-methoxypropanoic acid (PFMPA)	None	None	0.0032	0.0016	0.00058	Eurofins Sacramento
Perfluoro-4-methoxybutanoic acid (PFMBA)	None	None	0.0032	0.0016	0.00061	Eurofins Sacramento
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	None	None	0.0032	0.0016	0.00063	Eurofins Sacramento
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	None	None	0.0064	0.0030	0.00076	Eurofins Sacramento

Analyte	PAL[1] (µg/L)	PAL Reference[1]	Laboratory-Specific Limits (µg/L)[2, 4]			Laboratory
			LOQ	LOD	DL	
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	None	None	0.0064	0.0030	0.00082	Eurofins Sacramento
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	None	None	0.0032	0.0023	0.00073	Eurofins Sacramento

Notes:

[1] Unless otherwise indicated in Footnote 3, the PALs and PAL references are consistent with those presented for surface water in Worksheet # 15-3 in the Project-Specific Quality Assurance Project Plan, Keyport OU 1 Human Health and Ecological Risk Assessment (DON 2021a).

[2] Laboratory-specific limits listed here are current at the time of this writing but may change slightly during implementation of this project. Samples requiring dilutions to get target analyte concentrations within the calibration range of the instrument, or due to matrix interferences, will have elevated LOQs, LODs, and DLs. Non-detected results for samples will be evaluated at the reported LOD.

[3] 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.

[4] The purpose is to meet PALs for sampling locations that are anticipated to have low concentrations of VOCs.

Bolded values are greater than the associated PALs.

µg/L = microgram(s) per liter
CFR = Code of Federal Regulations
CWA = Clean Water Act
DL = detection limit
ELLE = Eurofins Lancaster Laboratories Environmental
EPA = U.S. Environmental Protection Agency
LOD = limit of detection
LOQ = limit of quantitation
MTCA = Model Toxics Control Act
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
PFAS = per- and polyfluoroalkyl substances
RSL = Regional Screening Level
SIM = selected ion monitoring
WAC = Washington Administrative Code

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Table 15-2. Reference Limits for Source Investigation - Sediment

Analyte	PAL (ng/kg)	PAL Reference	Laboratory-Specific Limits (ng/kg) [1, 2]			Laboratory
			LOQ	**LOD**	**DL**	
PCB Congeners (EPA Method 1668C)						
Sum of 209 PCB Congeners	12,000,000 Organic Carbon [3]	Marine sediment cleanup objective, Chapter 173-04 Washington Administration Code	2,100	1,600	820	ELLE
Other			**Laboratory-Specific Limits (mg/kg)**			
			LOQ	**LOD**	**DL**	
Total Organic Carbon (Lloyd Kahn)	None	None	300	200	100	ELLE

Notes:

[1] Laboratory-specific limits are updated periodically; updated values may vary slightly from those listed here. Values indicated here reflect the sum of the LOQs, LODs, and DLs for the individual 209 congeners or congener co-elutions. The laboratory will report results for the 209 congeners and the sum.

[2] Sample results (after adjusted for sample amount, dilution, and moisture content) will be reported on a dry-weight basis and likely will be higher than the values listed here. Non-detected results for samples will be evaluated at the reported LOD.

[3] For comparison to this organic carbon normalized PAL, it will be necessary to analyze samples for total organic carbon and calculate sample results for PCB congeners on an organic-carbon normalized basis.

mg/kg = milligram(s) per kilogram
ng/kg = nanogram(s) per kilogram
DL = detection limit
ELLE = Eurofins Lancaster Laboratories Environmental
EPA = U.S. Environmental Protection Agency
LOD = limit of detection
LOQ = limit of quantitation
MCL = maximum contaminant level
MTCA = Model Toxics Control Act
PAL = project action limit
PCB = polychlorinated biphenyl
RSL = Regional Screening Level

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SAP Worksheet #16: Project Schedule/Timeline Table

This worksheet presents the anticipated schedule for this project, which shows the timeframes for the major activities and deliverables, as well as the individual tasks and their interrelationships. The project schedule is presented in the following table.

Deliverable or Event	Timeframe	Planned Start	Planned Completion
Final SAP	Following incorporation of comments on draft	November 2022	March 2023
Field Work	Expect five weeks of field work	April 2023	May 2023
Laboratory Analysis	Following submittal of samples to laboratories	May 2023	June 2023
Data Validation	Following completion of laboratory analysis	June 2023	July 2023
Draft Report	Following incorporation of Navy comments on internal draft	July 2023	September 2023
Final Report	Following incorporation of project team comments on draft	October 2023	November 2023

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SAP Worksheet #17: Sampling Design and Rationale

The technical field program and laboratory analysis encompasses the following.

- HH/ERA Support – collect groundwater samples from four causeway monitoring wells
- Source Investigation Support – collect sediment samples from eight DUs using ISM.

The sampling design was developed to optimize resources and generate data to satisfy the project quality objectives. In addition, sampling design is intended to be consistent with related SAPs completed under separate contracts (DON 2021a and 2021b). The critical result at this stage is to identify areas of the site where target analyte concentrations, if present, exceed the PALs presented in Worksheet #15. The collected data will be used to identify target analyte concentrations that exceed the PALs. Additionally, data will be used to inform the ongoing supplemental RI and ongoing risk assessment. Worksheet #15 presents the LODs associated with these methods for the identified laboratories, in addition to the PALs.

Worksheet #18 provides a list of the sampling locations and analyses. The technical field program and laboratory analysis will be conducted in accordance with applicable state regulations and DON guidance documents, including the QSM Version 5.4 (DoD 2021a) and updates. Screened intervals for monitoring wells are presented in Table 17-1.

For the Source Investigation, sediment samples will be collected from eight DUs using ISM as shown on Figure 6 and as discussed below:

- Existing DU 1 will be divided into approximate halves, DU1a and DU1b, which will be parallel to the tide flat bank, to determine if concentrations are higher adjacent to seep SP1-1 or relatively the same within this area.
- Existing DU 2 will be divided into approximate halves, DU2a and DU2b, with the upstream portion closer to seep SP1-1 and the downstream portion closer to the tide gate to better determine if there is a gradation of PCB concentrations within this area.
- Existing DU 3 will be divided into DU3a and DU3b to obtain an approximate two-thirds upstream portion and one-third downstream portion to obtain data on sediment adjacent to the culvert near the tide gate.
- New DU 4 will be sampled to refine the understanding of PCB distribution in Marsh Creek.

- New DU 5 will be sampled to refine the understanding of PCB distribution in Marsh Creek.

Possible decision errors generated by sampling errors will be minimized during the field investigation by applying standardized field sampling methodologies, including the NAVFAC Northwest SOP: NAVFAC Northwest Field Procedures Manual Version 6.1 (NAVFAC Northwest 2019) and field procedures presented in Appendix C as identified in Worksheet #21. These procedures will ensure the custody and integrity of the samples begin at the time of sampling, and continue through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. Records concerning the custody and condition of the samples will be maintained in field logbook and combined with the laboratory records.

Table 17-1. Well Construction Details for Monitoring Wells

Location	Screened Interval of Well (feet below toc)	Total Well Depth (feet below toc)
HH/ERA Monitoring Wells		
MW1-38	44-49	50.23
MW1-39	27.7-32.7	33.45
MW1-74	45-55	60
MW1-75	75-80	80

Notes:
TBD = to be determined
toc = top of casing

SAP Worksheet #18: Location-Specific Sampling Methods/SOP Requirements Table

Location	Matrix	Analytical Parameter	Sampling SOP Reference
HH/ERA			
MW1-38	Groundwater	PFAS, cVOCs (low level), metals, PAHs, PCB Aroclors, and 1,4-dioxane	SOP 073, NAVFAC NW 1-C-5, FP5
MW1-39	Groundwater	PFAS, cVOCs (low level), metals, PAHs, PCB Aroclors, and 1,4-dioxane	SOP 073, NAVFAC NW 1-C-5, FP5
MW1-74	Groundwater	PFAS, cVOCs (low level), metals, PAHs, PCB Aroclors, and 1,4-dioxane	SOP 073, NAVFAC NW 1-C-5, FP5
MW1-75	Groundwater	PFAS, cVOCs (low level), metals, PAHs, PCB Aroclors, and 1,4-dioxane	SOP 073, NAVFAC NW 1-C-5, FP5

Location	Matrix	Analytical Parameter	Sampling SOP Reference
Source Investigation – Using ISM, collect 30-increment primary, duplicate, and triplicate samples at each location; Laboratory will homogenize and subsample each of the triplicate sets provided per location.			
DU1a[1]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU1b[1]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU2a[1]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU2b[1]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU3a[1]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU3b[1]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU4[2]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057
DU5[2]	Sediment	PCB Congeners and Total Organic Carbon	SOP 057

Notes:
[1]

[1] Divide existing decision unit (i.e., DU1 will be divided into DU1a and DU1b; DU2 will be divided into DU2a and DU2b; DU3 will be divided into DU3a and DU3b).
[2] New decision unit.
cVOC = chlorinated volatile organic compound
DU = decision unit
FP = field procedure
HH/ERA = human health/ecological risk assessment
ISM = incremental sampling methodology
NAVFAC = Naval Facilities Engineering Systems Command
NW = Northwest
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
PFAS = per- and polyfluoroalkyl substances
SOP = standard operating procedure

SAP Worksheet #19: Field Sampling Requirements Table

Analysis	Method	Laboratory	Sample Container[1, 2]	Preservation Requirements	Maximum Holding Time (preparation)	Maximum Holding Time (analysis)
HH/ERA –Groundwater						
cVOCs	8260D using low level implementation	Eurofins Seattle	(3) 40-mL glass vials (Teflon®-lined septum)	HCl to pH < 2; cool to ≤6°C; no headspace	14 days from sample collection until analysis	14 days from sample collection until analysis
PFAS	Draft 1633 compliant with DoD QSM v5.4 Table B-24	Eurofins Sacramento	(2) 500-mL HDPE and (1) 125-mL HDPE	cool to ≤6°C; protect from light	28 days from sample collection until extraction	28 days from sample extraction until analysis for sulfonates, 90 days for others
1,4-Dioxane	8270E SIM	Eurofins Seattle	(2) 250-mL amber glass with Teflon®-lined cap	Cool to ≤6°C	7 days from sample collection until extraction	40 days from extraction until analysis
PAHs	8270E SIM	ELLE	(2) 250-mL amber glass with Teflon®-lined cap	Cool to ≤6°C	7 days from sample collection until extraction	40 days from extraction until analysis
PCB Aroclors	8082A	ELLE	(2) 250-mL amber glass with Teflon®-lined cap	Cool to ≤6°C	None	None
Metals	6020B and 7470A	ELLE	(1) 250-mL HDPE bottle with unlined cap	HNO_3 to pH < 2	Mercury: 28 days from sample collection until analysis; Others: 180 days from collection until analysis	Mercury: 28 days from sample collection until analysis; Others: 180 days from collection until analysis
Source Investigation - Sediment						
PCB Congeners	1668C	ELLE	Glass[4]	Cool to ≤6°C from collection until receipt at laboratory; < -10°C after receipt at laboratory[5]	1 year from collection to extraction	1 year from extraction to analysis[3]
Total Organic Carbon	Lloyd Kahn	ELLE	Share with above[4]	Cool to ≤6°C	None	14 days

Notes:

[1] The number and size of container will be coordinated with the laboratory performing the analyses and may differ from that listed here. Samples collected using containers with Teflon lids will be shipped in separate coolers from those samples intended for PFAS analysis.

[2] For samples requiring MS/MSD analysis, triple the number of containers specified above.

[3] Thermal preservation specifications per the analytical method are listed in this table. Alternatively for analysis performed by ELLE, their SOP will be followed (thermally preserve at time of collection by cooling to <6°C, maintain at this temperature though extraction within 30 days from collection and analysis within 40 days of extraction.

[4] Laboratory will be instructed to homogenize the contents from all containers submitted for each sample and then subsample (30 increments) to obtain an aliquot for sample preparation and analysis of PCB congeners. A representative aliquot or subsamples will also be obtained from the container compilation for analysis of total organic carbon.

[5] Thermal preservation per the analytical method is listed in this table. Alternatively for analysis performed by ELLE, their SOP will be followed: thermally preserve at time of collection by cooling to <6°C, maintain at this temperature though extraction within 30 days from collection, and analyze within 40 days of extraction.

°C = degrees Celsius
cVOC = chlorinated volatile organic compound
ELLE = Eurofins Lancaster Laboratories Environmental
HCl = hydrochloric acid
HDPE = high-density polyethylene
HH/ERA = human health/ecological risk assessment
NHO_3 = nitric acid
LC/MS/MS = liquid chromatography with tandem mass spectrometry
mL = milliliters
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
PFAS = per- and polyfluoroalkyl substances
QSM = Quality Systems Manual for Environmental Laboratories
SOP = standard operating procedure

SAP Worksheet #20: Field Quality Control Sample Summary Table

Analysis	No. of Sampling Locations	No. of Field Replicates	No. of MS/MSDs	No. of Field or Source Blanks	No. of Equipment Blanks	No. of VOA Trip Blanks
HH/ERA – Groundwater						
VOCs	4	1	1 set	None	1	One per cooler
PFAS	4	1	1 set	1 field blank	1	One per cooler
1,4-Dioxane	4	1	1 set	None	1	None
PAHs	4	1	1 set	None	1	None
PCB Aroclors	4	1	1 set	None	1	None
Metals	4	1	1 set	None	1	None
Source Investigation – Sediment (30-increments per sample)						
PCB congeners	8	1 duplicate and triplicate per sample	None	1 source blank	1	None
Total organic carbon	8	1 duplicate and triplicate per sample	None	None	None	None

Field QC samples will be performed at the frequency specified in Worksheet #12; quantities listed in this table are estimated in some cases.

Notes:

cVOC = chlorinated volatile organic compound
HH/ERA = human health/ecological risk assessment
MSD = matric spike duplicate
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
PFAS = per- and polyfluoroalkyl substances
QC = quality control
VOA = volatile organic analysis
VOC = volatile organic compound

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SAP Worksheet #21: Field SOPs Reference Table

The requirements of the SOPs included with the NAVFAC Northwest SOP: NAVFAC Northwest Field Procedures Manual Version 6.1 (NAVFAC Northwest 2019) will be implemented as appliable content is consolidated in the project-specific field procedures presented in Appendix C.

Reference No.	Title, Revision Date and / or Number	Equipment Type	Modified for Project Work? (Y/N)	Comments
NAVFAC NW SOP I-A-7	IDW Management	General field equipment and supplies	No	none
NAVFAC NW SOP I-A-9	General Field Operations, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP I-A-10	Monitoring/Sampling Location Recording, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP I-A-11	Sampling Naming, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP I-B-8	Sediment Sampling, 2015	General field equipment and supplies	Yes	Follow requirements of SOP 057 for ISM, which are in general accordance with ITRC guidance for ISM (ITRC 2020)
NAVFAC NW SOP I-C-3	Monitoring Well Sampling, 2015	General field equipment and supplies	Yes	Follow requirements of SOP 073 for samples for PFAS
NAVFAC NW SOP I-C-5	Low-Flow Groundwater Purging and Sampling, 2015	General field equipment and supplies	Yes	Follow requirements of SOP 073 for samples for PFAS
NAVFAC NW SOP I-D-5	Water Level Measurements, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP I-D-7	Field Parameter Measurements, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP III-A	Laboratory QC Samples (Water, Soil), 2015	General laboratory equipment and supplies	No	none
NAVFAC NW SOP III-B	Field QC Samples (Water, Soil) Sediment, Tissue, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP III-D	Logbooks, 2015	Logbook, camera, indelible ink pen	No	none

Reference No.	Title, Revision Date and / or Number	Equipment Type	Modified for Project Work? (Y/N)	Comments
NAVFAC NW SOP III-E	Record Keeping, Sampling Labeling, and Chain-of-Custody Procedures, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP III-F	Sample Containers and Preservation, 2015	General field equipment and supplies	No	Follow requirements of SOP 057 for ISM and SOP 073 for samples for PFAS
NAVFAC NW SOP III-G	Sample Handling, Storage, and Shipping Procedures, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP III-I	Equipment Decontamination, 2015	General field equipment and supplies	No	none
NAVFAC NW SOP III-J	Equipment Calibration, Operation, and Maintenance, 2015	General field equipment and supplies	No	none
FP1	Mobilization and Demobilization	Pumping equipment, purge water drum	No	None
FP2	LNAPL/Water Level Measurement	Electronic water level meter or oil/water interface probe	No	None
FP 3	Field Parameter Measurement for Groundwater Sampling	Water quality meter	No	None
FP4	Low-Flow Purge Procedure for Groundwater Sampling	Pumping equipment, purge water drum, water quality meter	No	None
FP5	Decontamination of Field Instrumentation and Low-Flow Groundwater Sampling Equipment	Sample containers, coolers, and tubing	No	None
FP6	Sample Packing and Shipment	Coolers, ice/ice packs, custody seals, packing tape	No	None
FP7	Keeping a Site Logbook	Logbook, timer, camera, calculator	No	None
FP8	Water Quality Meter Calibration	Water quality meter, calibration solutions, DI water	No	None

Reference No.	Title, Revision Date and / or Number	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP 057	Standard Operating Procedure No. 057 for Incremental Sampling Methodology	Sampling tool	No	None
SOP 073	Sampling for Per and Polyfluorinated Alkyl Substances, Revision 1, effective June 2019	General field equipment and supplies, (prohibits Teflon or LDPE materials, waterproof materials, Gore-Tex materials)	No	None

Notes:
DI = deionized
FP = Field Procedure
ISM = incremental sampling methodology
LDPE = low-density polyethylene
LNAPL = light non-aqueous phase liquid
NAVFAC NW = Naval Facilities Engineering Systems Command Northwest
PFAS = per- and polyfluoroalkyl substances
QC = quality control
SOP = standard operating procedure

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SAP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
Water quality meter (YSI Pro DSS, Horiba U52, or equivalent)	Follow manufacturer's instructions.	Decontaminate and store in water short-term, long-term storage according to the manufacturer for each sensor.	Field test in accordance with the equipment manual and FP8	Visually inspect probes for cleanliness and wear.	Calibrate or verify calibration daily before use. Maintain and inspect daily when used. Verify calibration at mid-day (recommended) and at end of day (required).	Within calibration standard(s) range: pH, dissolved oxygen, and conductivity: ±10%, turbidity: ±10 NTU.	Cleaning and recalibration	Field personnel	See equipment manual
Electronic water level meter or oil/water Interface probe	Not applicable. Operate in accordance with the manufacturer's instructions	Decontaminate between wells	Field test in accordance with the manual; check value against known water level, clean and inspect probe	Inspect tape for kinks and cuts, inspect probe for dirt, check batteries	Daily	Response	Replace battery if no response during test button check.	Field personnel	See equipment manual

Notes:
FP = Field Procedure

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SAP Worksheet #23: Analytical SOP References Table

The table below contains information on the analytical instrumentation and associated laboratory SOPs (Appendix B) that will be followed during analysis of the environmental samples collected from the site.

Lab SOP No.	Title, Revision Date, and/or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Variance to QSM	Modified for Project?
EFGS-T-VOA-SOP41085	Determination of Volatile Organic Compounds by GC/MS [Methods 8260D], Version 2.1, Effective date: 28-June-2022	Definitive	Groundwater -VOCs	GC/MS	Eurofins Seattle	No	No
EFGS-T-MSS-SOP41389	Semi-volatile Organic Compound (Base/Neutrals and Acids) Analysis by GC/MS [Method 8270E], Version 1.1, Effective date: 17-Nov-2022	Definitive	Groundwater – 1,4-Dioxane	GC/MS SIM	Eurofins Seattle	No	No
WS-LC-0039	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Water, Solid, Biosolid, and Tissue [Method 1633]; Rev 1.0, Effective date 8-Apr-22	Definitive	Groundwater – PFAS	LC/MS/MS	Eurofins Sacramento	No	No
T-SVOA-WI9995	Semi-volatiles in Waters and Soils by Methods 8270C/D/E SIM and 625.1 SIM by GC/MS, Version 18.1, effective date: 27-Apr-2021	Definitive	Groundwater – PAHs	GC/MS SIM	ELLE	No	No
T-PEST-WI9238	Analysis of Polychlorinated Biphenyls (PCBs) by 8082A in Aqueous Samples using GC-ECD, Version 8, effective date: 02-Oct-2021	Definitive	Groundwater – PCB Aroclors	GC-ECD	ELLE	No	No
T-MET-WI11933	Metals by Inductively Coupled Plasma Mass Spectrometry for SW-846 Methods 6020/6020A/6020B (aqueous, solid, tissue and EPA 200.8 (aqueous), Version 12, effective date: 15-Apr-2022	Definitive	Groundwater – Metals	ICP/MS	ELLE	No	No
T-MET-WI7965	Mercury in Aqueous, Solid and Tissue Samples by EPA 7471A, 7471B, 7470A, and 245.1 rev 3 by Cold Vapor AA, Version 20, effective date: 27-Apr-2022	Definitive	Groundwater – Mercury	CVAAS	ELLE	No	No

Lab SOP No.	Title, Revision Date, and/or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Variance to QSM	Modified for Project?
T-HRMS-WI9432	PCB Congeners by Method 1668 HRGC/HRMS in Aqueous and Solid Matrices, Version 10, Effective date: 26-Apr-2021	Definitive	Sediment – PCB Congeners	HRGC/ HRMS	ELLE	No	No
T-IWC-WI11627	Total Organic Carbon and Total Carbon in Solids and Sludges by Combustion by SW-846 9060/9060A, Lloyd Kahn, Version 18, effective date: 04 Nov-2022	Definitive	Sediment – Total Organic Carbon	Total Organic Carbon Analyzer	ELLE	No	No

Notes:

CVAAS = cold-vapor atomic absorption spectrometer
ELLE = Eurofins Lancaster Laboratories Environmental
GC-ECD = gas chromatography – electron capture detector
GC/MS = gas chromatography/mass spectrometry
HRGC/HRMS = high-resolution gas chromatography/high resolution mass spectrometry
ICP/MS = inductively coupled mass spectrometry
LC/MS/MS = liquid chromatography/tandem mass spectrometry
PCB = polychlorinated biphenyl
PFAS = per- and polyfluoroalkyl substances
QSM = Quality Systems Manual
SIM = selected ion monitoring
SOP = standard operating procedure
VOC = volatile organic compound

SAP Worksheet #24: Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
GC/ECD	Minimum five-point ICAL for target analytes; lowest concentration standard at or near the LOQ.	ICAL is performed prior to sample analysis initially upon instrument set up, after major changes to system, or when ICAL or CCV cannot be met.	One of the options below: *Option 1*: RSD for each analyte ≤20% *Option 2*: linear least squares regression $r^2 \geq 0.99$ for each analyte or *Option 3*: non-linear least squares regression $r^2 \geq 0.99$	Correct problem, document in maintenance log, then repeat ICAL.	Analyst/ Supervisor	T-PEST-WI9238
	Retention time window width	At method setup and after major maintenance (e.g., column change)	Retention time is ± 3 times the standard deviation for each analyte's retention time from the 72-hour study or 0.03 minutes, whichever is greater	Not applicable	Analyst/ Supervisor	
	Second-source ICV	Once per ICAL	Analytes within ±20%D of expected value	Correct problem and verify second-source standard. Rerun second-source verification. If that fails, correct problem and repeat ICAL.	Analyst/ Supervisor	
	CCV	Prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence	Analytes within ±20% D of expected value	Correct problem, then rerun CCV. If that fails, repeat ICAL. Reanalyze samples since the last successful CCV.	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
GC/MS full scan	Minimum five-point ICAL for target analytes; lowest concentration standard at or near the LOQ.	ICAL is performed prior to sample analysis initially upon instrument set up, after major changes to system, or when ICAL or CCV cannot be met.	One of the options below: *Option 1*: RSD for each analyte ≤15% *Option 2*: linear least squares regression $r^2 \geq 0.99$ for each analyte or *Option 3*: non-linear least squares regression (quadratic) $r^2 \geq 0.99$	Correct problem, document in maintenance log, then repeat ICAL.	Analyst/ Supervisor	EFGS-T-VOA-SOP41085
	Mass spectrometer tuning check	Before ICAL and calibration verification and at the beginning of each 12-hour shift	Refer to criteria listed in method description	Retune instrument and verify. Rerun affected samples.	Analyst/ Supervisor	
	Second-source ICV	Once per ICAL	Analytes within ±20% of true value.	Correct problem and verify second-source standard. Rerun second-source verification. If that fails, correct problem and repeat ICAL.	Analyst/ Supervisor	
	CCV	Daily, before sample analysis (unless ICAL performed on same day), and after every 12 hours of analysis time	Analytes within ±20%D of true value. All reported analytes and surrogates within ±50% for end of analytical batch CCV.	Correct problem, then rerun CCV. If that fails, repeat ICAL.	Analyst/ Supervisor	
	Evaluation of relative retention time (RRT)	Each sample, standard, and QC sample	RRT of each target analyte within ± 0.06 RRT units of ICAL or CCV	Correct problem, then repeat ICAL.	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
GC/MS SIM	Minimum five-point ICAL for target analytes; lowest concentration standard at or near the LOQ.	ICAL is performed prior to sample analysis initially upon instrument set up, after major changes to system, or when ICAL or CCC cannot be met.	One of the options below: *Option 1*: RSD for each analyte ≤20% *Option 2*: linear least squares regression r^2 ≥0.99 for each analyte	Correct problem, document in maintenance log, then repeat ICAL.	Analyst/ Supervisor	EFGS-T-MSS-SOP41389 and T-SVOA-WI9995
	Mass spectrometer tuning check	Before ICAL and calibration verification and at the beginning of each 12-hour shift	Refer to criteria listed in method description. Tuning check can be acquired as a full scan.	Retune instrument and verify. Rerun affected samples.	Analyst/ Supervisor	
	Second-source ICV	Once per ICAL	Analytes within ±20% of true value.	Correct problem and verify second-source standard. Rerun second-source verification. If that fails, correct problem and repeat ICAL.	Analyst/ Supervisor	
	CCV	Daily, before sample analysis (unless ICAL performed on same day), and after every 12 hours of analysis time	Analytes within ±20%D of true value for beginning of analytical batch CCV. All reported analytes and surrogates within ±50% for end of analytical batch CCV.	Correct problem, then analyze two consecutive CCVs. If either fails, perform corrective action until a passing CCV is attained and then reanalyze all samples since last acceptable CCV. Alternatively, repeat ICAL.	Analyst/ Supervisor	
	Evaluation of relative retention time (RRT)	Each sample, standard, and QC sample	RRT of each target analyte within ± 0.06 RRT units of ICAL or CCV	Correct problem, then repeat ICAL.	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
ICP/MS	Tuning	Before ICAL	Mass calibration ≤ 0.1 amu from the true value; resolution < 0.9 amu full width at 10% peak height.	Retune instrument and verify before proceeding with ICAL.	Analyst/ Supervisor	T-MET-WI11933
	ICAL	ICAL is performed daily prior to sample analysis and initially upon instrument set up, after major changes to system, or when ICAL or CCV cannot be met.	r^2 ≥0.99 if more than one standard and a blank	Correct problem then repeat ICAL.	Analyst/ Supervisor	
	Second-source ICV	Once per ICAL, prior to beginning a sample run.	Analytes within ±10% of true value.	Correct problem and verify second-source standard. Rerun second-source verification. If that fails, correct problem and repeat ICAL.	Analyst/ Supervisor	
	CCV	Prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence.	Analytes within ±10% of true value.	Correct problem, then rerun CCV. If that fails, repeat ICAL. Reanalyze all samples since the last successful CCV.	Analyst/ Supervisor	
	Low-level calibration check standard	Daily	Analytes within ±20% of true value.	Correct problem and repeat ICAL.	Analyst/ Supervisor	
	Calibration blank (ICB/CCB)	Before beginning a sample run, after every 10 samples, and at end of the analysis sequence.	No analytes detected > ½ LOQ.	Correct problem. Re-prep and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Analyst/ Supervisor	
	Linear dynamic range or high-level check standard	At initial setup and every 6 months	Within ±10% of true value.	NA	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
ICP/MS	ICS	At the beginning of an analytical run	ICS-A: Absolute value of concentration for non-spiked analytes <LOD (unless they are a verified trace impurity from one of the spiked analytes) and; ICS-AB: within ±20% of true value.	Terminate analysis; locate and correct problem; reanalyze ICS, reanalyze all samples.	Analyst/ Supervisor	T-MET-WI11933
CVAAS	Five-point ICAL and a blank	ICAL is performed daily prior to sample analysis and initially upon instrument set up, after major changes to system, or when CCV cannot be met.	$r^2 \geq 0.99$	Correct problem then repeat ICAL.	Analyst/ Supervisor	T-MET-WI7965
	Second-source ICV	Once per ICAL, prior to beginning a sample run.	Analytes within ±10% of true value.	Correct problem and verify second-source standard. Rerun second-source verification. If that fails, correct problem and repeat ICAL.	Analyst/ Supervisor	
	CCV	After every 10 field samples, and at the end of the analysis sequence.	Analytes within ±10% of true value.	Correct problem, then rerun CCV. If that fails, repeat ICAL. Reanalyze all samples since the last successful CCV.	Analyst/ Supervisor	
	Low-level calibration check standard	Daily	Analytes within ±20% of true value.	Correct problem and repeat ICAL.	Analyst/ Supervisor	
	Calibration blank (ICB/CCB)	Before beginning a sample run, after every 10 samples, and at end of the analysis sequence.	No analytes detected > ½ LOQ.	Correct problem. Re-prep and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
LC/MS/MS	Mass calibration	Initially prior to use, annually, and after performing major maintenance, as required to maintain documented instrument sensitivity and stability performance	Calibrate the mass scale of the mass spectrometer with calibration compounds and procedures described by the manufacturer; must evaluate an ion range that encompasses the ion range of the analytes of interest for this project. Unit resolution is demonstrated when the value of the peak width at half-height is within 0.5 ± 0.1 amu or daltons of the known masses.	Correct problem, document in maintenance log	Analyst/ Supervisor	WS-LC-0039
	Minimum six-point ICAL for target analytes; lowest concentration standard at or near the LOQ	ICAL is performed prior to sample analysis initially upon instrument set up, after major changes to system, or when ICV or CCV criteria is not met.	Signal/noise ratio ≥3:1. The % relative standard deviation of the response factors for analytes or the relative standard error must be <20%.	Correct problem, document in maintenance log, then repeat ICAL	Analyst/ Supervisor	
	Second-source ICV	Once per ICAL	Analytes within ±30% of expected value	Correct problem and verify second-source standard; re-run second-source verification; If that fails, correct problem and repeat ICAL	Analyst/ Supervisor	
	CCV	Concentration of analytes at the mid-level calibration concentration is performed at the start of each analytical sequence, after every 12 hours or 10 samples, whichever is more frequent, and at the end of the sequence.	Analytes within ±30%D of expected value from ICAL	Correct problem, then re-run CCV; If that fails, repeat ICAL	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	Ion transitions	Every field sample, standard, blank, and QC sample	If a qualitative or quantitative standard containing an isomeric mixture (branched and linear isomers) of an analyte is commercially available for an analyte, the quantification ion used must be the quantification ion identified in Table 2 of the Draft Method 1633 unless interferences render the product ion unusable as the quantification ion. In cases where interferences render the product ion unusable as the quantification ion, the alternative product ion can be used for this project,	Not applicable	Analyst/ Supervisor	
	Bile salt standards	Daily, prior to analysis of all matrix types (e.g., aqueous)	Draft Method 1633 requirements for evaluation of the relationship of the retention time of the bile salt peak to the retention time window of PFS must be met for the applicable matrix type. The retention time window of PFOS applies to the retention times of all isomers of PFOS. The retention time of the bile salt peak must fall out of the retention time window of PFOS by at least one minute.	Correct problem. No samples shall be analyzed until acceptance criteria for the bile salt standard has been met.	Analyst/ Supervisor	
	Instrument sensitivity check	Daily at the beginning of each analytical sequence, prior to sample analysis.	Analyte concentrations must be within ±30% of their true values	Correct problem, then re-run ISC; If that fails, repeat ICAL	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	Instrument blanks	Immediately following the highest standard analyzed and daily prior to sample analysis	Concentration of each analyte must be ≤½ the LOQ	Correct problem, and re-run instrument blank; Additional samples shall not be analyzed until acceptance criteria are met		
HRGC/MS	Minimum five-point ICAL for target analytes; lowest concentration standard at or near the LOQ.	ICAL is performed prior to sample analysis initially upon instrument set up, after major changes to system, or when ICAL or CCV cannot be met.	*Option 1*: RSD for each target analyte ≤20% *Option 2*: linear least squares regression $r^2 \geq 0.99$ for each analyte or *Option 3*: non-linear least squares regression (quadratic) $r^2 \geq 0.99$	Correct problem, document in maintenance log, then repeat ICAL.	Analyst/ Supervisor	T-HRMS-WI9432
	Mass spectrometer tuning check	Before ICAL and calibration verification and at the beginning of each 12-hour shift	Refer to criteria listed in method description, meet required resolving power of 10,000 (10% valley) at m/z 330.9792 or alternate perfluorokerosene fragment in the range of 300 to 350.	Retune instrument and verify. Rerun affected samples.	Analyst/ Supervisor	
	Second-source ICV	Once per ICAL	Analytes within ±20% of true value for target analytes.	Correct problem and verify second-source standard. Rerun second-source verification. If that fails, correct problem and repeat ICAL.	Analyst/ Supervisor	
	CCV	Daily, before sample analysis (unless ICAL performed on same day), and after every 12 hours of analysis time	Target analytes within ±25%D of true value. Ion ratios within laboratory SOP control limits.	Correct problem, then rerun CCV. If that fails, repeat ICAL.	Analyst/ Supervisor	
	Evaluation of RRT	Each sample, standard, and QC sample	Within method requirements	Correct problem, then repeat ICAL.	Analyst/ Supervisor	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
Total Organic Carbon Analyzer	ICAL with a minimum of four points	Monthly of after CCV fails	$r^2 \geq 0.99$	Perform aggressive instrument maintenance and recalibrate.	Analyst/ Supervisor	
	ICB	After each ICAL	No analytes detected > LOQ	Perform aggressive instrument maintenance and recalibrate.	Analyst/ Supervisor	
	ICV	After each ICAL	Analytes within ±10% of true value for target analytes	Reanalyze the ICV. If the ICV fails again, perform system maintenance and recalibrate.	Analyst/ Supervisor	
	CCV	After every 10 samples, and at the end of the analysis sequence.	Manufacturer acceptance limits (varies by lot for this certified reference material, 50% to 153% for the current in-house lot)	Correct problem, then rerun CCV. If that fails, repeat ICAL. Reanalyze all samples since the last successful CCV.	Analyst/ Supervisor	
	CCB	After every 10 samples, and at end of the analysis sequence.	No analytes detected > LOQ.	All affected samples are reanalyzed.	Analyst/ Supervisor	

Notes:

%D = percent difference
amu = atomic mass unit
CCB = continuing calibration blank
CCV = continuing calibration verification
COD = coefficient of determination
CVAAS = cold-vapor atomic absorption spectrometry
ELLE = Eurofins Lancaster Laboratories Environmental
GC-ECD = gas chromatography – electron capture detector
GC/MS = gas chromatography/mass spectrometry
HRGC/HRMS = high-resolution gas chromatography/high resolution mass spectrometry
ICAL = initial calibration
ICB = initial calibration blank
ICP/MS = inductively coupled mass spectrometry
ICS = Interfering element check standards
ICV = initial calibration verification
LC/MS/MS = liquid chromatography with tandem mass spectrometry
LOD = limit of detection
LOQ = limit of quantitation
QC = quality control
RF = response factor
RRT = relative retention time
RSD = relative standard deviation
SIM = selected ion monitoring

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SAP Worksheet #25: Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
GC/MS	**Daily:** check inlet pressure and sufficient supply of carrier gas; check temperatures of inlet and detectors; verify temperature program; check septa, clean injection port or replace injection port liner, and cut column if needed; check carrier gas supply; check tune parameters. **As needed:** check oil levels in mechanical pumps and the diffusion pump if vacuum is insufficient; replace electron multiplier; clean source; replace filaments; change rough pump oil and exhaust filters; and relubricate the turbomolecular pump bearing wick.	Tuning and sensitivity check	Instrument performance and sensitivity	Service vacuum pumps twice per year, other maintenance as needed	Tune and calibration verification standard (ICV and CCVs) pass QC criteria	Corrective action may include inspection of system; correct problem; and rerun calibration and affected samples, as well as calling the service engineer.	Laboratory Manager/ Analyst	EFGS-T-VOA-SOP41085, EFGS-T-MSS-SOP41389 T-SVOA-WI9995 T-HRMS-WI9432
GC-ECD	Daily: check carrier gas supply; check temperatures of inlet and detectors; verify temperature program. As needed: check septa, clean injection port or replace injection port liner, and cut column if needed; reactivate carrier gas drying agents; replace or repair flow controllers if constant flow cannot be maintained; replace disposables; bake out instrument; recondition column; and perform detector cleaning.	Detector signals and chromatogram review	Instrument performance and sensitivity	Maintenance as needed	Calibration verification standards (ICV and CCVs) pass QC criteria	Corrective action may include inspection of system; correct problem; and rerun calibration and affected samples, as well as calling the service engineer.	Analyst/ Supervisor	T-PEST-WI9238

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
ICP/MS	Daily: monitor gas supplies; examine and replace pump tubing, filters, and O-rings. As needed: monitor and clean or replace torches, spray chambers, air filters, injectors, purge windows and lenses, and igniters and load coils; fill argon humidifier with water; change oil in vacuum pumps.	Tuning and sensitivity check	Check argon supply pressure, operating vacuum, temperature of the cooling chiller, and the nebulizer flow-rate, torch for residue, and level of the internal fluid reservoir and cooling fluid, as well as waste.	Daily, as needed	CCV passes QC criteria	Corrective action may include inspection of system; correct problem; and rerun calibration and affected samples, as well as calling the service engineer.	Analyst/ Supervisor	T-MET-WI11933
CVAAS	Daily: monitor gas supplies; examine and replace pump tubing, filters, and O-rings. Evaluate pump performance. As needed: monitor and clean or replace lamp. Change drying tube.	Normal analysis	Check gas pressure and level of waste container and inspect drying tube for moisture.	Daily and as needed	CCV passes QC criteria	Corrective action may include inspection of system; correct problem; and rerun calibration and affected samples, as well as calling the service engineer.	Analyst/ Supervisor	T-MET-WI7965
LC/MS/MS	Backflush of column, injection port and pre-columns, cleaning of ion spray cone, adjustment of collision energies, others as needed	Calibration check	Instrument performance and sensitivity	As needed	Tune and calibration verification standard (ICV and CCVs) pass QC criteria	Corrective action may include inspection of system; correct problem; and rerun calibration and affected samples, as well as calling the service engineer.	Laboratory Manager/ Analyst	WS-LC-0039

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
Total Organic Carbon Analyzer	As needed replacement of components	Calibration checks	Visual inspection of components	As needed maintenance /calibration checks after every 10 sample injections	Manufacturer acceptance limits	Recalibration	Analyst/ Supervisor	T-IWC-WI11627

Notes:
CCV = continuing calibration verification
CVAAS = cold-vapor atomic absorption spectrometer
ELLE = Eurofins Lancaster Laboratories Environmental
GC-ECD = gas chromatography – electron capture detector
GC/MS = gas chromatography/mass spectrometry
HRGC/HRMS = high-resolution gas chromatography/high resolution mass spectrometry
ICP/MS = inductively coupled mass spectrometry
ICV = initial calibration verification
LC/MS/MS = liquid chromatography with tandem mass spectrometry
QC = quality control

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SAP Worksheet #26: Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT	
Sample Collection (Personnel/Organization):	Field Technician/EA
Sample Packaging (Personnel/Organization):	Field Technician/EA
Coordination of Shipment (Personnel/Organization):	Field Technician/EA
Type of Shipment/Carrier:	FedEx or equivalent, Courier
SAMPLE RECEIPT AND ANALYSIS	
Sample Receipt (Personnel/Organization):	Tracy Dutton/Eurofins Seattle, Amanda Barnhart/ELLE, and David Alltucker/Eurofins Sacramento
Sample Custody and Storage (Personnel/Organization):	
Sample Preparation (Personnel/Organization):	
Sample Determinative Analysis (Personnel/Organization):	
SAMPLE ARCHIVING	
Field Sample Storage (Nos. of days from sample collection):	1 day (maximum)
Sample Extract/Digestate Storage (No. of days from extraction/digestion):	60 days
SAMPLE DISPOSAL	
Personnel/Organization:	Tracy Dutton/Eurofins Seattle, Amanda Barnhart/ELLE, and David Alltucker/Eurofins Sacramento
Number of Days from Analysis:	60 days

Notes:

EA = EA Engineering, Science, and Technology, Inc., PBC

ELLE = Eurofins Lancaster Laboratories Environmental

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SAP Worksheet #27: Sample Custody Requirements

27.1 Sample Custody and Documentation

Sampling information will be recorded on a chain-of-custody record and in a permanently bound field logbook. The entries will be legible and recorded in indelible ink.

27.2 Sample Identification

Sample ID is discussed in Section 14.3.

27.3 Sample Packing and Shipping

The laboratory will supply sample containers and appropriate preservation additives, if needed. Onsite personnel will be responsible for ensuring that adequate sample containers are available for the work scheduled at the sample collection points. After the appropriate labels and chain-of-custody records are completed, the sample containers will be placed in coolers and cooled for transport to the laboratory.

Environmental samples from this project will be packaged and shipped in a manner that will ensure the safety and accountability of each sample, and all procedures will be in accordance with applicable federal and local requirements. The persons packing and shipping environmental samples should review and be aware of state, federal, Department of Transportation, and International Air Transport Association regulations governing environmental and hazardous sample packaging. The person(s) shipping the samples is responsible for maintaining compliance with applicable packaging, labeling, and shipping requirements.

27.4 Chain of Custody

Chain-of-custody documentation is required for each sample to track collection, shipments, laboratory receipt, custody, and disposal. The chain-of-custody record is preprinted with appropriate space for the applicable data to be entered.

Each individual who has the samples in their possession will sign the chain-of-custody record. A sample is considered to be in custody under the following conditions:

- It is in actual possession or in view of the person who collected the sample
- It is locked in a secure area
- It is placed in an area restricted to authorized personnel.

Each sample will be assigned a unique sample ID number, which will be entered on the chain-of-custody record. If the samples are transported to an offsite laboratory by a courier service, the courier's name and/or airbill number will be noted on the chain-of-custody record. As a final step, custody seals are attached to the front and back of the lid of the shipping container. Upon arrival at the laboratory, the samples in the cooler are checked against the chain-of-custody record by laboratory personnel. If discrepancies are noted, the samples in question will be segregated and field personnel will be immediately notified. The person accepting the delivery will sign and date the chain-of-custody record.

SAP Worksheet #28: Analytical Quality Control and Corrective Action

The tables below describe the QC protocols that will be employed at the laboratory in conjunction with analysis.

Table 28-1. Summary of QC Procedures for Volatiles by GC/MS

Matrix:	Groundwater
Analytical Group:	cVOCs
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 8260D / EFGS-T-VOA-SOP41085
Field Sampling Organization:	EA
Analytical Organization:	Eurofins Seattle
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal standards	During acquisition of calibration standard, samples, and QC check samples	Retention time within ±10 seconds from retention time of the midpoint standard in the ICAL; EICP area within - 50% to +100% of ICAL midpoint standard (note that on days when ICAL is not performed, the daily initial CCV may be used).	Inspect mass spectrometer and GC for malfunctions; mandatory reanalysis of samples analyzed while system was malfunctioning in accordance with QSM requirements. If field samples still outside criteria, qualify data, and explain in case narrative.	Analyst / Section Supervisor	Accuracy/ Bias	Meet EPA method requirements
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD	Minimum one per 20 samples	<u>%R</u>: DoD QSM Table C-24 limits <u>RPD</u>: RPD of analytes ≤20% (between MS and MSD).	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM

Matrix:	Groundwater
Analytical Group:	cVOCs
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 8260D / EFGS-T-VOA-SOP41085
Field Sampling Organization:	EA
Analytical Organization:	Eurofins Seattle
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
LCS	One per preparation batch (20 samples)	%R: DoD QSM Table C-24 limits	Evaluate samples for detections and LCS for high bias. If LCS has high bias, and samples non-detect, report with case narrative comment. If LCS has low bias, or if there are detections for critical target analytes, fix problem, reprepare, and reanalyze the LCS and samples associated with failed analytes.	Analyst / Section Supervisor	Precision and Accuracy/Bias	DoD QSM
Surrogates	Field and QC samples.	%R: DoD QSM Table C-24 limits	Evaluate data, if samples non-detect and surrogate recovery is above upper QC limits, report with case narrative comment. If obvious chromatographic interference is present, report with narrative comment. Otherwise, re-extract and reanalyze.	Analyst / Section Supervisor	Accuracy	DoD QSM

Notes:
%D = percent difference
%R = percent recovery
CCV = continuing calibration verification
COC = chemical of concern
DQI = data quality indicator
EICP = extracted ion current profile
EPA = U.S. Environmental Protection Agency
GC = gas chromatography
ICAL = initial calibration
ICV = initial calibration verification
LCS = laboratory control sample
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
QC = quality control
QSM = Quality Systems Manual
RPD = relative percent difference
SME = sporadic marginal exceedance
SOP = standard operating procedure
VOC = volatile organic compound

Table 28-2. Summary of QC Procedures for 1,4-Dioxane and PAHs by GC/MS SIM

Matrix:	Groundwater
Analytical Group:	1,4-Dioxane and PAHs
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 8270E SIM / EFGS-T-MSS-SOP41389 and T-SVOA-WI9995
Field Sampling Organization:	EA
Analytical Organization:	Eurofins Seattle for 1,4-dioxane and ELLE for PAHs
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal standards	During acquisition of calibration standard, samples, and QC check samples	Retention time within ±10 seconds from retention time of the midpoint standard in the ICAL; EICP area within - 50% to +100% of ICAL midpoint standard (note that on days when ICAL is not performed, the daily initial CCV may be used).	Inspect mass spectrometer and GC for malfunctions; mandatory reanalysis of samples analyzed while system was malfunctioning in accordance with QSM requirements. If field samples still outside criteria, qualify data, and explain in case narrative.	Analyst / Section Supervisor	Accuracy/ Bias	Meet EPA method requirements
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD	Minimum one per 20 samples	<u>%R</u>: DoD QSM Table C-28 limits for PAHs, 40-140% for 1,4-dioxane <u>RPD</u>: RPD of analytes ≤40% (between MS and MSD).	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM for PAHs, lab limits for 1,4-dioxane
LCS	One per preparation batch (20 samples)	<u>%R</u>: DoD QSM Table C-28 limits for PAHs, 40-140% for 1,4-dioxane	Evaluate samples for detections and LCS for high bias. If LCS has high bias, and samples non-detect, report with case narrative comment. If LCS has low bias, or if there are detections for critical target analytes, fix problem, reprepare, and reanalyze the LCS and samples associated with failed analytes.	Analyst / Section Supervisor	Precision and Accuracy/Bias	DoD QSM for PAHs, lab limits for 1,4-dioxane

Matrix:	Groundwater
Analytical Group:	1,4-Dioxane and PAHs
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 8270E SIM / EFGS-T-MSS-SOP41389 and T-SVOA-WI9995
Field Sampling Organization:	EA
Analytical Organization:	Eurofins Seattle for 1,4-dioxane and ELLE for PAHs
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Surrogates	Field and QC samples.	%R: DoD QSM Table C-28 limits for PAHs (lab limits if alternate surrogates are used); 40-140% for 1,4-dioxane	Evaluate data, if samples non-detect and surrogate recovery is above upper QC limits, report with case narrative comment. If obvious chromatographic interference is present, report with narrative comment. Otherwise, re-extract and reanalyze.	Analyst / Section Supervisor	Accuracy	DoD QSM for PAHs, lab limits for 1,4-dioxane-d8

Notes:
%D = percent difference
%R = percent recovery
CCV = continuing calibration verification
COC = chemical of concern
DQI = data quality indicator
EICP = extracted ion current profile
EPA = U.S. Environmental Protection Agency
GC = gas chromatography
ICAL = initial calibration
ICV = initial calibration verification
LCS = laboratory control sample
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
PAH = polycyclic aromatic hydrocarbon
QC = quality control
QSM = Quality Systems Manual
RPD = relative percent difference
SOP = standard operating procedure

Table 28-3. Summary of QC Procedures for PCB Aroclors by GC/ECD

Matrix:	Groundwater
Analytical Group:	PCB Aroclors
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 8082A / T-PEST-WI9238
Field Sampling Organization:	EA
Analytical Organization:	ELLE
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD	Minimum one per 20 samples	%R: DoD QSM Table C-18 limits RPD: RPD of analytes ≤30% (between MS and MSD).	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM
LCS	One per preparation batch (20 samples)	%R: DoD QSM Table C-18 limits	Evaluate samples for detections and LCS for high bias. If LCS has high bias, and samples non-detect, report with case narrative comment. If LCS has low bias, or if there are detections for critical target analytes, fix problem, reprepare, and reanalyze the LCS and samples associated with failed analytes.	Analyst / Section Supervisor	Precision and Accuracy/Bias	DoD QSM
Surrogates	Field and QC samples.	%R: Laboratory control limits since not specified in DoD QSM Table C-18 or analytical method	Evaluate data, if samples non-detect and surrogate recovery is above upper QC limits, report with case narrative comment. If obvious chromatographic interference is present, report with narrative comment. Otherwise, re-extract and reanalyze.	Analyst / Section Supervisor	Accuracy	Laboratory control limits

Notes:
%D = percent difference
%R = percent recovery
CCV = continuing calibration verification
COC = chemical of concern
DQI = data quality indicator
EICP = extracted ion current profile
EPA = U.S. Environmental Protection Agency
GC = gas chromatography
ICAL = initial calibration
ICV = initial calibration verification
LCS = laboratory control sample
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
PCB = polychlorinated biphenyl
QC = quality control
QSM = Quality Systems Manual
RPD = relative percent difference
SOP = standard operating procedure
VOC = volatile organic compound

Table 28-4. Summary of QC Procedures for Metals by ICP/MS

Matrix:	Groundwater
Analytical Group:	Metals
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 6020B / T-MET-WI11933
Field Sampling Organization:	EA
Analytical Organization:	ELLE
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standards	Every field sample, standard, and QC sample	Internal standard intensity in the samples within 30-120% of the intensity of the internal standard in the ICAL blank.	If recoveries are acceptable for QC samples, but not field samples, the field samples may be considered to have a matrix effect. Reanalyze samples at 5-folde dilutions until criteria is met. For failed QC samples, correct problem and rerun all associated failed field samples.	Analyst / Section Supervisor	Accuracy/ Bias	DoD QSM
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD	Minimum one per 20 samples	%R: DoD QSM Table C-6 limits RPD: RPD of analytes ≤20% (between MS and MSD)	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM
Dilution Test	One per preparation batch if MS or MSD fails.	Five-fold dilution must agree within ±10% of the original measurement.	No specific correction action	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM
Post Digestion Spike Addition	One per preparation batch if MS or MSD fails	%R within 80-120%	No specific correction action	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM
LCS	One per preparation batch (20 samples)	%R: DoD QSM Table C-6 limits	Evaluate samples for detections and LCS for high bias. If LCS has high bias, and samples non-detect, report with case narrative comment. If LCS has low bias, or if there are detections for critical target analytes, fix problem, reprepare, and reanalyze the LCS and samples associated with failed analytes.	Analyst / Section Supervisor	Precision and Accuracy/Bias	DoD QSM

Notes:
%D = percent difference
%R = percent recovery
CCV = continuing calibration verification
COC = chemical of concern
DQI = data quality indicator
EICP = extracted ion current profile
EPA = U.S. Environmental Protection Agency
GC = gas chromatography
ICAL = initial calibration
ICV = initial calibration verification
LCS = laboratory control sample
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
QC = quality control
QSM = Quality Systems Manual
RPD = relative percent difference
SOP = standard operating procedure
VOC = volatile organic compound

Table 28-5. Summary of QC Procedures for Mercury by CVAAS

Matrix:	Groundwater
Analytical Group:	Mercury
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 7470A / T-MET-WI7965
Field Sampling Organization:	EA
Analytical Organization:	ELLE
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD	Minimum one per 20 samples	%R: DoD QSM Table C-12 limits RPD: RPD of analytes ≤20% (between MS and MSD)	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM
LCS	One per preparation batch (20 samples)	%R: DoD QSM Table C-12 limits	Evaluate samples for detections and LCS for high bias. If LCS has high bias, and samples non-detect, report with case narrative comment. If LCS has low bias, or if there are detections for critical target analytes, fix problem, reprepare, and reanalyze the LCS and samples associated with failed analytes.	Analyst / Section Supervisor	Precision and Accuracy/Bias	DoD QSM

Notes:

%D = percent difference
%R = percent recovery
CCV = continuing calibration verification
COC = chemical of concern
DQI = data quality indicator
EICP = extracted ion current profile
EPA = U.S. Environmental Protection Agency
GC = gas chromatography
ICAL = initial calibration
ICV = initial calibration verification
LCS = laboratory control sample
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
QC = quality control
QSM = Quality Systems Manual
RPD = relative percent difference
SOP = standard operating procedure

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Table 28-6. Summary of QC Procedures for PCB Congeners by HRGC/MS

Matrix:	Sediment
Analytical Group:	PCB Congeners
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	EPA 1668C / T-HRMS-WI9432
Field Sampling Organization:	EA
Analytical Organization:	ELLE
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal standards	Every sample, standard, and QC sample	%R for each internal standard in undiluted samples must be within method limits	Identify and correct problem, then reprepare and reanalyze the samples with failed internal standards	Analyst / Section Supervisor	Accuracy/ Bias	Meet EPA method requirements
Method Blank	One per preparation batch (up to 20 samples)	No target analyte ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Identify and correct problem. If necessary, reprepare and analyze the method blank and the samples processed with the contaminated blank.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD[1]	Minimum one per 20 samples	<u>%R</u>: DoD QSM Table C-1 limits <u>RPD</u>: RPD of analytes ≤30% (between MS and MSD)	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	DoD QSM
LCS[1]	One per preparation batch (20 samples)	<u>%R</u>: DoD QSM Table C-1 limits	Identify and correct problem, then reanalyze. If %R is still outside control limits, reprepare and analyze the LCS and associated samples.	Analyst / Section Supervisor	Precision and Accuracy/Bias	DoD QSM

Notes:

[1] The LCS and MS/MSD will be spiked with the following congeners: PCB-1, -3, -4, -15, -19, -37, -54, -77, -81, -104, -105, -114, -118, -123, -126, -155, -156/157, -167, -169, -188, -189, -202, -205, -206, -208, 209. For congeners with no %R control limits in the DoD QSM, laboratory control limits will be used.

%R = percent recovery
LCS = laboratory control sample
LOQ = limit of quantitation
MS/MSD = matrix spike/matrix spike duplicate
QC = quality control
RPD = relative percent difference

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Table 28-7. Summary of QC Procedures for LC/MS/MS Method

Matrix:	Groundwater
Analytical Group:	PFAS
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	LC/MS/MS compliant with QSM Version 5.4 Table B-24 (2021) / WS-LC-0039
Field Sampling Organization:	EA
Analytical Organization:	Eurofins Sacramento
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Extracted Internal standards (IS)	Every sample, standard, and QC sample	QC and field samples must recover within in-house limits (use 20-150% until in-house limits are established)	Mandatory reanalysis using a fresh aliquot of the extract is required. If failure does not confirm, report the second analysis. If still outside criteria, a diluted aqueous sample must be analyzed.	Analyst / Section Supervisor	Accuracy/ Bias	Meet EPA method requirements
Non-extracted IS	Every sample, standard, and QC sample	Non-extracted IS areas must be greater than 30% of the average area of the calibration standards in undiluted sample extracts and sample; same criteria for dilutions using corrected areas to account for dilution	Mandatory reanalysis using a fresh aliquot of the extract is required. If failure does not confirm, report the second analysis. If still outside criteria, a diluted aqueous sample must be analyzed.	Analyst / Section Supervisor	Accuracy/ Bias	Meet EPA method requirements
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater).	Verify instrument clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
MS/MSD	One per preparation batch (up to 20 samples)	%R: Within in-house limits (use 40-150% if no in-house limits are established) RPD: RPD ≤30% (between MS and MSD)	If not related to matrix interference, re-extract and reanalyze MS/MSD.	Analyst / Section Supervisor	Precision and Accuracy /Bias	%R: In-house limits (use 40-150% if not established) RPD ≤30%
LCS and low-level LCS	One set per preparation batch (up to 20 samples)	%R: Within in-house limits (use 40-150% if no in-house limits are established)	Reanalyze LCS and impacted samples once. If acceptable, report. Otherwise, re-extract and analyze samples.	Analyst / Section Supervisor	Precision and Accuracy/Bias	%R: In-house limits (use 40-150% if no in-house limits are established)

Notes:
%D = percent difference
%R = percent recovery
CCV = continuing calibration verification
EICP = extracted ion current profile
EPA = U.S. Environmental Protection Agency
ICAL = initial calibration
IS = internal standard
LCS = laboratory control sample
LOQ = limit of quantitation
MS = matrix spike
MSD = matrix spike duplicate
QC = quality control
QSM = Quality Systems Manual
RPD = relative percent difference
SOP = standard operating procedure

Table 28-8. Summary of QC Procedures for Total Organic Carbon by Lloyd Kahn

Matrix:	Sediment
Analytical Group:	Total Organic Carbon
Sampling SOP:	See Worksheet #21
Analytical Method/SOP Reference:	Lloyd Kahn / T-IWC-WI11627
Field Sampling Organization:	EA
Analytical Organization:	ELLE
Number of Samples:	See Worksheet #20

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	One per preparation batch (up to 20 samples)	No target analytes ≥ ½ LOQ or >1/10 the amount measured in any sample (whichever is greater).	Verify instrument is clean (evaluate calibration blank and samples prior to method blank), then reanalyze. Evaluate to determine if systematic issue within laboratory, correct, then re-prepare and reanalyze the method blank and samples processed with the contaminated blank in accordance with DoD QSM requirements.	Analyst / Section Supervisor	Accuracy/ Bias Contamination	No target analytes ≥½ LOQ
LCS	One per preparation batch (20 samples)	<u>%R</u>: Within manufacturer's limits for this certified reference material (50%-153% for the current in-house lot)	Evaluate samples for detections and LCS for high bias. If LCS has high bias, and samples non-detect, report with case narrative comment. If LCS has low bias, fix problem, reprepare, and reanalyze the LCS and associated samples.	Analyst / Section Supervisor	Precision and Accuracy/Bias	Manufacturer's limits
Laboratory Quad-ruplicate	One per preparation batch (20 samples)	<u>%RSD</u>: Within in-house limits of 0% to 25%	If not related to matrix interference, re-extract and reanalyze laboratory quadruplicate.	Analyst / Section Supervisor	Precision	In-house limits

Notes:
%R = percent recovery
DoD = Department of Defense
DQI = data quality indicator
LCS = laboratory control sample
LOQ = limit of quantitation
QC = quality control
QSM = Quality Systems Manual
RSD = relative standard deviation
SOP = standard operating procedure

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SAP Worksheet #29: Project Documents and Records Table

The project documentation and records will be maintained by the EA TOM or designee.

Record	Generation	Verification	Storage Location/Archival
Sample Collection and Field Records			
Field Logbook or Data Collection Sheets	Field Staff	TOM	Project File
Chain-of-Custody Records	Field Staff	TOM	Project File
Air Bills	Field Staff	TOM	Project File
Deviations	QC Officer	TOM	Project File
Corrective Action Reports	QC Officer	TOM	Project File
Correspondence	Project Team	TOM	Project File
Data Assessments and Reporting			
Analytical Data Summary Report	Staff Scientist	TOM	Project File
Data Quality Assessment Report (to be included as an appendix in the Analytical Data Summary Report)	Project Chemist	QA Manager or designee	Project File
Data Validation Report (to be included as an appendix in the Analytical Data Summary Report)	Third-party data validation firm	Project Chemist	Project File
Laboratory Records			
Offsite Laboratory Report and Electronic Data Deliverable [1]	Laboratory Project Manager	Project Chemist	Contractor and Laboratory Project Files
Documentation of Laboratory Method Deviations, Analytical Audit Checklist, and Lab Assessment	QA Manager	Laboratory Manager	Offsite Laboratory
Laboratory QA Manual	QA Manager or designee	Laboratory Manager	Offsite Laboratory
Laboratory Name and Applicable Accreditations	QA Manager or designee	Laboratory Manager	Offsite Laboratory
LOD Study Information	Analyst and Supervisor	QA Manager or designee	Offsite Laboratory
Instrument Calibration, Initial Precision, and Accuracy Tests	Analyst and Supervisor	QA Manager or designee	Offsite Laboratory
Documentation of Manual Integrations including Chromatograms Showing the Before and After with the Analyst Name and Reason for the Manual Integration.	Analyst and Supervisor	QA Manager or designee	Offsite Laboratory

Record	Generation	Verification	Storage Location/Archival
Sample Chronology (Time of Receipt, Tracking, Extraction, and Analysis) and Associated Forms	Analyst and Supervisor	QA Manager or designee	Offsite Laboratory

Notes:

[1] The offsite laboratory report will include the information specified in the QSM, Appendix A, including the information for third-party review, as appropriate to the analytical methodology.

LOD = limit of detection
QA = quality assurance
QC = quality control
TOM = Task Order Manager

SAP Worksheet #30: Analytical Services Table

Matrix	Analytical Group	Sample Locations/ID Numbers	Analytical SOP	Data Package Turnaround Time	Laboratory/Organization (name and address, contact person and telephone number)	Backup Laboratory/Organization (name and address, contact person and telephone number)
HH/ERA –Groundwater						
Groundwater	VOCs	See Worksheet #18	Refer to Worksheet #23	15 working days	Eurofins Seattle, Tracy Dutton, (253) 248-4970	NA
Groundwater	PFAS	See Worksheet #18	Refer to Worksheet #23	20 working days	Eurofins Sacramento, David Alltucker (916) 374-4383	NA
Groundwater	1,4-Dioxane	See Worksheet #18	Refer to Worksheet #23	15 working days	Eurofins Seattle, Tracy Dutton, (253) 248-4970	NA
Groundwater	PAHs	See Worksheet #18	Refer to Worksheet #23	15 working days	ELLE, Amanda Barnhart, (717) 556-3860	NA
Groundwater	PCB Aroclors	See Worksheet #18	Refer to Worksheet #23	15 working days	ELLE, Amanda Barnhart, (717) 556-3860	NA
Groundwater	Metals	See Worksheet #18	Refer to Worksheet #23	15 working days	ELLE, Amanda Barnhart, (717) 556-3860	NA
Source Investigation - Sediment						
Sediment	PCB Congeners	See Worksheet #18	Refer to Worksheet #23	15 working days	ELLE, Amanda Barnhart, (717) 556-3860	NA

Notes:
ELLE = Eurofins Lancaster Laboratories Environmental
ID = identification
NA = not applicable
PFAS = per- and polyfluoroalkyl substances
SOP = standard operating procedure
VOC = volatile organic compound

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SAP Worksheet #31: Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Person(s) Responsible for Performing Assessment	Person(s) Responsible for Responding to Assessment Findings	Person(s) Responsible for Identifying and Implementing Corrective Action	Person(s) Responsible for Monitoring Effectiveness of Corrective Action
Field Sampling Audit	Audit will occur once during each type of field activity (i.e., groundwater sampling, etc.) and subsequently if there is a gap of 6 months or more.	Internal	QA Manager or designee	EA TOM	EA TOM	EA Senior Technical Review
Field Documentation Audit	At the conclusion of the field event.	Internal	QA Manager or designee	EA TOM	EA TOM	EA Senior Technical Review
Analytical Data Review	For each sample delivery group	External	Third-party Data Validation Firm	EA Project Chemist	EA Project Chemist	EA Senior Chemist
Data Review Technical Systems Audit	Reviewed data	Internal	QA Manager or designee	EA TOM	EA TOM	EA Senior Technical Review
Management Systems Review	Quarterly	Internal	QA Manager or designee	EA TOM	EA TOM	EA Senior Technical Review

Notes:
EA = EA Engineering, Science, and Technology, Inc., PBC
QA = quality assurance
TOM = task order manager

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SAP Worksheet #32: Assessment Findings and Corrective Action Responses Table

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (name, title, organization)	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (name, title, organization)	Timeframe for Response
Field Sampling and Documentation Audit	Memorandum	EA TOM	7 days after assessment	Email or letter correspondence	QA Manager or designee	1 week after receipt of email or memorandum
Analytical Data Review	Memorandum	Laboratory QA Manager, Laboratory Project Manager, Eurofins Seattle/ ELLE/Eurofins Sacramento	30 days after review	Email or letter correspondence	EA Project Chemist	21 days for reissuance
Data Review Technical Systems Audit	Memorandum	EA TOM	30 days after review	Email or letter correspondence	QA Manager or designee	20 days after review
Management Systems Review	Memorandum	EA TOM	Immediate correction - written documentation due within 1 week	Email or letter correspondence	QA Manager or designee	7 days from receipt of memorandum

Notes:
EA = EA Engineering, Science, and Technology, Inc., PBC
ELLE = Eurofins Lancaster Laboratories Environmental
QA = quality assurance
TOM = Task Order Manager

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SAP Worksheet #33: Quality Assurance Management Reports Table

Type of Report	Frequency	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation	Report Recipient(s)
Field Sampling Audit Memo	Audit will occur once during each type of field activity (i.e., groundwater sampling, etc.) and subsequently if there is a gap of 6 months or more.	7 days after assessment	QA Manager or designee	Program Manager, QA Manager
Field Documentation Audit Memo	At the conclusion of the field event.	7 days after assessment	QA Manager or designee	Program QA Manager
Data Validation Reports	For each sample delivery group	30 days after review	Third-party Data Validation Firm	QA Manager, Project Chemist, RPM
Analytical Data Summary Report	Prior to issuance	7 days after review	EA TOM	Program Manager, QA Manager
Quarterly Project Review Summary	Quarterly	Immediate correction – written documentation due within 1 week	EA TOM	Program Manager, QA Manager

Notes:
QA = quality assurance
RPM = Remedial Project Manager
TOM = Task Order Manager

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SAP Worksheet #34: Data Verification (Step I) Process Table

Data Review Input	Description	Internal / External	Responsible for Verification
Review of field procedures	Determine if field procedures are performed in accordance with this SAP and prescribed procedures. The TOM or designee will prepare a Field Surveillance checklist.	Internal	TOM, PQCM
Review of field notes	Ensure field notes allow reconstruction of activities. Sample inventory logs will include sample designation, labeling and descriptions, and will ensure accurate location where samples are collected. Field logbooks will be placed in the project file upon project completion. The reviewer will initial and date the review in field logbook for each day of field activities.	Internal	PQCM or designee
Review of Chain-of-Custody and Sample Receipt forms	Chain-of-custody records will be reviewed internally upon their completion and verified against the packed sample coolers they represent. Verify that samples are labeled and handled in accordance with procedures described in this plan, and that the correct analytes are requested. A copy of each chain-of-custody record will be placed in the project files. The original chain-of-custody records will be taped inside the cooler for shipment to the analytical laboratory.	Internal	PQCM or designee, Project Chemist
Review of instrument calibration sheets	Determine whether analytical instruments are calibrated and used in accordance with manufacturers' requirements.	External	Laboratory Supervisor
Sampling Analytical Data Package	Analytical data packages will be verified internally by the laboratory performing the work for completeness prior to submittal of the data to the data validators.	External	Laboratory Project Manager Project Chemist
Review of sample results	Verify that sensitivity goals were attained and requested analyses were completed.	Internal	Laboratory Project Manager, Project Chemist

Notes:

PQCM = Project Quality Control Manager

TOM = Task Order Manager

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SAP Worksheet #35: Data Validation (Steps IIa and IIb) Process Table

Data Review Input	Description	Internal / External	Responsible for Verification (title, organization)
Analytes	Determine whether analytes specified in the Reference Limits and Evaluation Table were analyzed and reported by the laboratory. Documentation will be presented in the summary report for the sampling event.	Internal	Project Chemist
Chain-of-Custody and Field QC Logbook	Examine traceability of data from sample collection to generation of project data. The reviewer will initial and date the review in the field logbook and on the field forms	Internal	Project Chemist, PQCM
Onsite data (e.g., PID measurements, etc.)	Onsite data will be reviewed against SAP requirements for completeness and accuracy based on the field calibration requirements. The reviewer will initial and date the review in the field logbook or on the applicable calibration form.	Internal	FTL, PQCM
Sampling SOPs and field notes	Ensure that sampling SOPs are followed. The FTL, PQCM, or designee will prepare a Field Surveillance checklist.	Internal	FTL, PQCM
Sample receipt forms and lab documentation of sample handling	Ensure that holding times, preservation, and temperature requirements described in SAP are met. Documentation will be provided in the data validation report, which will be presented as an appendix to the summary report for the sampling event.	External and Internal	Data Validator, Project Chemist
Documentation of method QC results	Establish that method required QC samples were run and met required limits. Documentation will be provided in the data validation report, which will be presented as an appendix to the summary report for the sampling event.	External and Internal	Data Validator, Project Chemist
Documentation of SAP QC results	Establish that required QC samples described in the SAP were run and met required limits. Documentation will be provided in the data validation report, which will be presented as an appendix to the summary report for the sampling event.	External and internal	Data Validator, Project Chemist
LODs	Establish that sample results met the project sensitivity goals. Documentation will be provided in the data usability assessment, which will be presented as an appendix to the summary report for the sampling event.	Internal	Project Chemist

Notes:
IIa = compliance with methods, procedures, and contracts [see Table 10, page 117, UFP-QAPP Manual (EPA 2005)]
IIb = comparison with measurement performance criteria in the WP [see Table 11, page 118, UFP-QAPP Manual (EPA 2005)]
FTL = field team lead
LOD = limit of detection
NAVFAC = Naval Facilities Engineering Systems Command
QC = quality control
SAP = Sampling and Analysis Plan
SOP = standard operating procedure
TOM = Task Order Manager

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SAP Worksheet #36: Data Validation (Steps IIa and IIb) Summary Table

Data Review Input	Description	Internal / External	Responsible for Verification (title, organization)
Data Validation Reports	Data validation will be performed at minimum 10% Stage 4 and remainder (maximum 90%) at Stage 2B following DoD General Data Validation Guidelines (DoD 2019). As appropriate, criteria specified in this SAP, the DoD QSM (2021a), and analytical methods will be evaluated.	External and Internal	Data Validator, Project Chemist
Groundwater – VOCs (including cVOCs), 1,4-Dioxane, and PAHs	Data validation will be performed at a minimum of 10% Stage 4 and remainder (maximum 90%) at Stage 2B following Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS (DoD 2020) and Data Validation Guidelines Modules 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination (DoD 2022a)	External and Internal	Data Validator, Project Chemist
Groundwater – PCB Aroclors	Data validation will be performed at a minimum of 10% Stage 4 and remainder maximum 90%) at Stage 2B following Data Validation Guidelines Module 4: Data Validation Procedure for Organic Analysis by GC (DoD 2021b) and Data Validation Guidelines Modules 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination (DoD 2022a)	External and Internal	Data Validator, Project Chemist
Groundwater – Metals	Data validation will be performed at minimum 10% Stage 4 and remainder (maximum 90%) at Stage 2B following DoD General Data Validation Guidelines (2019a) and, as applicable to analysis by Methods 6020B and 7470A, Data Validation Guidelines Module 5: Data Validation Procedure for Metals by ICP-MS (DoD 2022b). If clarification in applicability is needed for mercury, NAVFAC Northwest 2015 Data Validation SOP II-E can be used.	External and Internal	Data Validator, Project Chemist
Groundwater - PFAS	Data validation will be performed at minimum 10% Stage 4 and remainder (maximum 90%) at Stage 2B following Data Validation Guidelines Module 6: Data Validation Procedure for PFAS Analysis by QSM Table B-24 (DoD 2022c)	External and Internal	Data Validator, Project Chemist
Sediment – PCB Congeners	National Functional Guidelines for High Resolution Superfund Methods Data Review (EPA 2020)	External and Internal	Data Validator, Project Chemist

Notes:
IIa = compliance with methods, procedures, and contracts [see Table 10, page 117, UFP-QAPP guidance (EPA 2005)]
IIb = comparison with measurement performance criteria in the WP [see Table 11, page 118, UFP-QAPP guidance (EPA 2005)]
Updated DoD Guidelines or Modules may be used if released prior to data validation for this project.

DoD = Department of Defense

GC = gas chromatography

MS = mass spectrometry

PFAS = per- and polyfluoroalkyl substances

QSM = Quality Systems Manual for Environmental Laboratories

VOC = volatile organic compound

SAP Worksheet #37: Usability Assessment

The usability assessment will consider whether data meet project quality objectives (PQOs) as they relate to the decision(s) to be made and evaluates whether data are suitable for making that decision. The usability assessment is a data review and will be performed only on data of known and documented quality. The results of the data usability assessment will be included as a section in each report that presents project data. The data usability assessment will be performed by the project team that prepares the report including the TOM, the QA Manager, and the Project Chemist.

To accomplish this step of data review, the project team will do the following:

- Perform data validation as described in Worksheet #36.
- Perform the usability assessment process and procedures, including interim steps and any statistics, equations, and computer algorithms that will be used to assess data.
- Describe the documentation that will be generated during the usability assessment.
- Identify the personnel responsible (by title and organizational affiliation) for performing the usability assessment.
- Describe how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies if applicable.
- Describe the evaluative procedures used to assess overall measurement error associated with the project and include the DQIs.

SUMMARY OF DATA QUALITY INDICATORS

Precision, accuracy/bias, representativeness, comparability, completeness, and sensitivity are the DQIs used to assess the data produced during the project. Each DQI is described below, including a definition of the terminology, the referenced process for calculating the indicator, and the referenced measurement performance criteria (MPC) for this project. A description of how the DQIs should be incorporated into the usability section is found under each parameter heading.

Precision

Precision is the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves. Precision is usually expressed as standard deviation, variance, %D, or range, in either absolute or relative terms. The QC measures for precision include field duplicates or replicates, laboratory duplicates, MS/MSD, analytical replicates, and surrogates. To meet the needs of the data users, project data must generally meet the MPC for precision specified in SAP Worksheet #12, Measurement Performance Criteria, and supporting worksheets.

Precision may be the result of one or more of the following: field instrument variation, analytical measurement variation, poor sampling technique, sample transport problems, or spatial variation (heterogeneous sample matrices). To identify the cause of imprecision, the field sampling design rationale and sampling techniques will be evaluated by the reviewer, and both field and analytical duplicate/replicate sample results will be reviewed. The process for calculating precision is detailed in and will be in accordance with the UFP-QAPP Manual, Section 2.6.2.1 (EPA 2005). If poor precision is indicated in both the field and analytical duplicates/ replicates, then the laboratory may be the source of error. If poor precision is limited to the field duplicate/replicate results, then the sampling technique, field instrument variation, sample transport, and/or spatial variability may be the source of error. Validation will be performed on the definitive data packages.

The usability assessment will:

- Compare overall field duplicate/replicate precision data from data collected for the project for each matrix, analytical group, and concentration level.
- Evaluate the limitations on the use of project data when overall precision is poor or when poor precision is limited to a specific sampling or laboratory (analytical) group, data set or sample delivery group, matrix, analytical group, or concentration level.

Accuracy/Bias

Accuracy is the degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) that are due to sampling and analytical operations. Examples of QC measures for accuracy include MS samples, laboratory control samples, and equipment rinsate blanks. In order to meet the needs of the data users, project data must generally meet the MPC for accuracy/bias specified in SAP Worksheets #12 and #28, Measurement Performance Criteria. The process for calculating accuracy/bias is detailed in, and will be in accordance with, the UFP-QAPP Manual, Section 2.6.2.2 (EPA 2005). The usability assessment will:

- Compare overall contamination and accuracy/bias for data collected for the project for each matrix, analytical group, and concentration level.
- Evaluate the limitations on the use of project data if extensive contamination and/or inaccuracy or bias exists, or when inaccuracy is limited to a specific sampling or laboratory group, data set or sample delivery group, matrix, analytical group, or concentration level.
- Evaluate the impact of qualitative and quantitative trends in bias on the sample data.

Representativeness

Representativeness is the measure of the degree to which data accurately and precisely represent a characteristic of a population, a parameter variation at a sampling point, a process condition, or an environmental condition. To meet the needs of the data users, project data must generally meet the MPC for sample representativeness specified in SAP Worksheets #12 and #28, Measurement Performance Criteria. The process for calculating representativeness is detailed in, and will be in accordance with, the UFP-QAPP Manual, Section 2.6.2.4 (EPA 2005).

If field duplicate or replicate precision checks indicate potential spatial variability, additional scoping meetings and subsequent re-sampling may be needed in order to collect data that are more representative of a non-homogeneous site.

The usability assessment will:

- Compare overall sample representativeness for each matrix, analytical group, and concentration level.
- Evaluate the limitations on the use of project data when overall non-representative sampling has occurred, or when non-representative sampling is limited to a specific sampling, group, data set or sample delivery group, matrix, analytical group, or concentration level.

Comparability

Comparability is the degree to which different methods, data sets, and decisions agree or can be represented as similar. Comparability describes the confidence (expressed qualitatively or quantitatively) that two data sets can contribute to a common analysis and interpolation. In order to meet the needs of the data users, project data must generally meet the MPC for comparability specified in the SAP Worksheets #12 and #28, Measurement Performance Criteria.

Additional detail regarding the process of assessing comparability is detailed in, and will be in accordance with, UFP-QAPP Manual, Section 2.6.2.5 (EPA 2005). Different situations require different assessments of comparability, as in the following:

- If two or more sampling procedures or sampling teams are used to collect samples, describe how comparability will be assessed for each matrix, analytical group, and concentration level.
- If two or more analytical methods or SOPs are used to analyze samples of the same matrix and concentration level for the same analytical group, the comparability will be assessed between the two data sets and discussed.

- If replicate samples are analyzed, the specific method and %D formula that will be used to assess replicate sample comparability for individual data points will be discussed.
- Field blanks will also be used to determine if contamination has been environmentally introduced to samples, reducing their comparability.

The usability assessment will:

- Compare overall comparability for the project for each matrix, analytical group, and concentration level.
- Evaluate if screening data will be confirmed by definitive methods and document the specific method and %D formula that will be used to assess comparability for individual data points.
- Evaluate overall comparability, describe the procedures used to perform overall assessment of comparability, and include mathematical and statistical formulas for evaluating screening and confirmatory data comparability.
- If the project is long-term monitoring, determine whether project data should be compared with previously generated data to ascertain the possibility of false positives and false negatives, and positive and negative trends in bias. Data comparability is extremely important in these situations.
- Evaluate anomalies detected in the data that may reflect a changing environment or indicate sampling and/or analytical error. Comparability criteria should be established to evaluate these data sets to identify outliers and the need for re-sampling as warranted.
- Determine the limitations on the use of project data when project-required data comparability is not achieved for the overall project or when comparability is limited to a specific sampling or laboratory group, data set or sample delivery group, matrix, analytical group, or concentration level.
- Document the failure to meet replicate sampling comparability criteria and discuss the impact on usability.
- If data are not usable to adequately address environmental questions or support project decision-making, address how this problem will be resolved and discuss the potential need for re-sampling.
- If long-term monitoring data are not comparable, address whether the data indicate a changing environment, or are a result of sampling or analytical error.

Sensitivity and Quantitation Limits

Sensitivity is the capability of a test method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest. Examples of QC measures for determining sensitivity include laboratory fortified blanks, DLs, LOD, and LOQ studies, and low-level calibration standards. In order to meet the needs of the data users, the project data must meet the MPC for sensitivity and project DLs specified in Worksheet #15, Reference Limits and Evaluation Table. The process for assessing sensitivity is detailed in the UFP-QAPP Manual, Section 2.6.2.3 (EPA 2005).

The laboratory will establish a DL, typically the method detection limit (MDL), using a scientifically valid and documented procedure. The MDL is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is the laboratory's "best case" sensitivity for a given analytical method. The laboratory may establish MDLs for each method, matrix, and analyte for each instrument the laboratory plans to use for the project using the statistical method presented in 40 CFR Part 136, Appendix B.

The LOD will be established quarterly by spiking a blank matrix at two to three times the DL for single analyte standards or one to four times the DL for multi-analyte standards. This spike concentration is the LOD for each analyte and is specific for each matrix, method, and instrument.

The LOQ will be determined at least quarterly for each analyte of concern following a documented procedure at the laboratory. The validity of the LOQ will be determined by the analysis of a QC sample containing the analyte at one to two times the estimated LOQ and within the calibration range of the instrument. The LOQ is valid if the recovery of the analyte is within the test method's acceptance recovery limits for accuracy.

A general summary of the relationship between the DL terms used above is presented below:

$$DL<LOD<LOQ<\text{Reporting Limit}$$

The following requirements apply to the determination of DL, LOD, and LOQ:

- The apparent signal to noise ratio at the LOD must be at least three and in the results must meet method requirements for analyte identification (e.g., ion abundance, second column confirmation, or pattern recognition). If no measurement of noise is available for a given method, then the LOD must yield a result that is at least three standard deviations greater than the mean blank concentration.
- If multiple instruments are used, the lab must verify the DL, LOD, and LOQ on each.
- If the LOD verification fails, then the laboratory must repeat the DL and LOD determinations at higher concentrations.

- The laboratory will maintain documentation of the DL, LOD, and LOQ studies and these measures of instrument sensitivity will be performed at least quarterly.
- A non-detectable result will be reported as less than the LOD. The “J” flag will be applied to the detectable results that fall between the DL and the LOQ, indicating the variability associated with the result. No detectable results will be reported below the DL.

The usability assessment will:

- Compare overall sensitivity from multiple data sets collected for the project for each matrix, analytical group, and concentration level.
- Determine the impact of the lack of sensitivity or higher LODs on data usability; if information is available, indicate that sensitivity or project-specific LODs were not achieved.
- Evaluate the limitations on the use of project data if project-required sensitivity and LODs are not achieved for the project data, or when sensitivity is limited to a specific sampling or laboratory group, data set or sample delivery group, matrix, analytical group, or concentration level.

Unless otherwise noted in WS#15, the offsite laboratories’ LODs are capable of meeting sensitivity requirements, and the compounds of potential concern can be detected below the project evaluation criteria.

Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under correct, normal circumstances. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. In order to meet the needs of the data users, project data must generally meet the MPC for completeness specified in the SAP Worksheets #12 and #28, Measurement Performance Criteria.

Completeness measures the effectiveness in sample collection, analysis, and result reporting of the entire investigation, and is calculated on a per-analyte basis by the following equation:

$$\%Completeness = \frac{Number\ of\ valid\ results}{Number\ of\ possible\ results} \times 100$$

For instances of samples that could not be analyzed for any reason (holding time violations in which resampling and analysis were not possible, samples spilled or broken, etc.), the numerator of this calculation becomes the number of possible results minus the number of possible results not reported.

A completeness check will be done on the data generated by the laboratory. For each analyte, completeness will be calculated as the number of data points for each analyte that meet the MPC for precision, accuracy/bias, and sensitivity, divided by the total number of data points for each analyte. A discussion will follow summarizing the calculation of data completeness. Conclusions about the completeness of the data for each analyte will be drawn and any limitations on the use of the data will be described.

For this project, 90% of usable sample data is considered the minimal acceptance criteria for completeness.

The usability assessment will:

- Compare overall completeness for each matrix, analytical group, and concentration level.
- Determine the limitations on the use of project data if project-required completeness is not achieved for the overall project, or when completeness is limited to a specific sampling or laboratory group, data set or sample delivery group, matrix, analytical group, or concentration level.

ACTIVITIES

The entire project team will reconvene to perform the usability assessment to ensure that the PQOs are understood, and the full scope is considered. If, for whatever reason, (precision, accuracy/bias, comparability, sensitivity, completeness) MPC are not achieved and it has been determined that certain project data are not usable, then the project team will determine if it is necessary to take further action, such as resampling, to ensure that the data quality objectives have been met.

The items listed under **Considerations for Usability Assessment** below are examples of specific items that will be considered during the project under the usability assessment.

Evaluative Procedures used to Assess Overall Measurement Error for the Project:

- ***Precision***—The precision of the data will be determined by a comparison to other similar data, as well as comparisons with field duplicates or replicates, lab duplicates/replicates and MSDs.

- ***Accuracy/Bias***—The accuracy of data will be assessed by comparing observed values with reference values through the use of MSs, LCSs, and equipment rinsate blanks.
- ***Representativeness***—Although sample size somewhat limits the statistical confidence for comparing contaminant levels to the entire population, the proposed sample sizes do conform to currently accepted methods.
- ***Comparability***—The results of this study will be used as a benchmark for determining comparability for data collected during past and future sampling events using the same or similar sampling and analytical SOPs.
- ***Completeness***—A completeness check will be done on the data generated by the laboratory. Completeness will be calculated as the number of data points for each analyte that generally meet the MPC for precision, accuracy/bias, and sensitivity, divided by the total number of data points. A discussion will follow summarizing the calculation of data completeness. Conclusions about the completeness of the data for each analyte will be drawn and limitations on the use of the data will be described.
- ***Reconciliation***—Each of the PQOs presented in Worksheet #12 will be examined to determine if the objective was met. This examination will include a combined overall assessment of the results of each analysis pertinent to an objective. Each analysis will first be evaluated separately in terms of the major impacts observed from the DQI and MPC assessments. Based on the results of these assessments, the quality of the data will be determined. Based on the quality determined, the usability of the data for each analysis will be determined. Based on the combined usability of the data from the analyses for an objective, it will be determined if the PQO was met and whether PALs were exceeded. The final reports will include summaries of the points that went into the reconciliation of each objective. As part of the reconciliation of each objective, conclusions will be drawn and limitations on the usability of the data will be described.

The laboratory Project Manager, EA Project Chemist, and Project QA and QC Managers may participate in this activity.

Assessment Documentation

A usability report will be written that discusses precision, accuracy/bias, representativeness, comparability, and completeness as detailed within this worksheet. This narrative report will include worksheets and supporting documentation to assess the PQOs and conclusions and limitations of the associated data. The specific details of each section of the usability assessment documentation can be found above under the individual DQIs.

Considerations for the Usability Assessment are as follows:

- Data Deliverables and SAP Deviation—Ensure that the necessary information was provided.
- Deviations—Determine the impact of deviations on the usability of data.
- Sampling Locations—Determine if alterations to sample locations continue to satisfy the project objectives.
- Chain-of-Custody Record—Establish that problems with documentation or custody procedures do not prevent the data from being used for the intended purpose.
- Holding Times—Determine the acceptability of data if holding times were exceeded.
- Damaged Samples—Determine whether the data from damaged samples are usable. If the data cannot be used, determine whether resampling is necessary.
- SOPs and Methods—Evaluate the impact of deviations from SOPs and specified methods on data.
- QC Samples—Evaluate the implications of unacceptable QC sample results on the data usability for the associated samples. For example, consider the effects of observed blank contamination.
- Matrix—Evaluate matrix effects (interference or bias). For example, consider the effects of observed matrix spike recoveries.
- Meteorological Data and Site Conditions—Evaluate the possible effects of meteorological (e.g., wind, rain, temperature) and site conditions on sample results. Review field reports to identify whether any unusual conditions were present and how the sampling plan was executed.
- Comparability—Ensure that results from different data collection activities achieve an acceptable level of agreement.
- Completeness—Evaluate the impact of missing information. Ensure that enough information was obtained for the data to be usable (completeness as defined in PQOs documented in the SAP).
- Background—Determine if background levels have been adequately established (if appropriate).
- Critical Samples—Establish that critical samples and critical target analytes, as defined in the SAP, were collected and analyzed. Determine if the results meet criteria specified in the SAP.
- Data Restrictions—Describe the exact process for handling data that do not meet PQOs (i.e., when MPC are not met). Depending on how those data will be used, specify the restrictions on use of those data for environmental decision making.

- Usability Decision—Determine if the data can be used to make a specific decision considering the implications of deviations and corrective actions.
- Usability Report—Discuss and compare overall precision, accuracy/bias, representativeness, comparability, completeness, and sensitivity for each matrix, analytical group, and concentration level. Describe limitations on the use of project data if criteria for DQIs are not met.

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Appendix A

Department of Defense Environmental Laboratory Accreditation Program Certificates and Scopes of Testing

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CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424

Fulfills the requirements of

ISO/IEC 17025:2017

and

U.S. Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories (DoD QSM V5.4)

In the field of

TESTING

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 19 January 2025
Certificate Number: L2236

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

and

U.S. Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories (DoD QSM V5.4)

Eurofins Seattle

5755 8th Street East
Tacoma, WA 98424
Terri Torres
253-922-2310

TESTING

Valid to: **January 19, 2025**   Certificate Number: **L2236**

Environmental

Non-Potable Water

Technology	Method	Analyte
ICP-AES	EPA 6010B/6010D/200.7	Silver
ICP-AES	EPA 6010B/6010D/200.7	Aluminum
ICP-AES	EPA 6010B/6010D/200.7	Arsenic
ICP-AES	EPA 6010B/6010D/200.7	Boron
ICP-AES	EPA 6010B/6010D/200.7	Barium
ICP-AES	EPA 6010B/6010D/200.7	Beryllium
ICP-AES	EPA 6010B/6010D/200.7	Calcium
ICP-AES	EPA 6010B/6010D/200.7	Cadmium
ICP-AES	EPA 6010B/6010D/200.7	Cobalt
ICP-AES	EPA 6010B/6010D/200.7	Chromium
ICP-AES	EPA 6010B/6010D/200.7	Copper
ICP-AES	EPA 6010B/6010D/200.7	Iron
ICP-AES	EPA 6010B/6010D/200.7	Potassium
ICP-AES	EPA 6010B/6010D/200.7	Magnesium
ICP-AES	EPA 6010B/6010D/200.7	Manganese

Non-Potable Water

Technology	Method	Analyte
ICP-AES	EPA 6010B/6010D/200.7	Molybdenum
ICP-AES	EPA 6010B/6010D/200.7	Sodium
ICP-AES	EPA 6010B/6010D/200.7	Nickel
ICP-AES	EPA 6010B/6010D/200.7	Lead
ICP-AES	EPA 6010B/6010D/200.7	Antimony
ICP-AES	EPA 6010B/6010D/200.7	Selenium
ICP-AES	EPA 6010B/6010D/200.7	Silicon
ICP-AES	EPA 6010B/6010D/200.7	Tin
ICP-AES	EPA 6010B/6010D/200.7	Titanium
ICP-AES	EPA 6010B/6010D/200.7	Strontium
ICP-AES	EPA 6010B/6010D/200.7	Thallium
ICP-AES	EPA 6010B/6010D/200.7	Vanadium
ICP-AES	EPA 6010B/6010D/200.7	Zinc
ICP-MS	EPA 6020/6020B/200.8	Silver
ICP-MS	EPA 6020/6020B/200.8	Aluminum
ICP-MS	EPA 6020/6020B/200.8	Arsenic
ICP-MS	EPA 6020/6020B/200.8	Barium
ICP-MS	EPA 6020/6020B/200.8	Beryllium
ICP-MS	EPA 6020/6020B/200.8	Cadmium
ICP-MS	EPA 6020/6020B/200.8	Cobalt
ICP-MS	EPA 6020/6020B/200.8	Chromium
ICP-MS	EPA 6020/6020B/200.8	Copper
ICP-MS	EPA 6020/6020B/200.8	Iron
ICP-MS	EPA 6020/6020B/200.8	Manganese
ICP-MS	EPA 6020/6020B/200.8	Molybdenum
ICP-MS	EPA 6020/6020B/200.8	Nickel
ICP-MS	EPA 6020/6020B/200.8	Lead
ICP-MS	EPA 6020/6020B/200.8	Antimony
ICP-MS	EPA 6020/6020B/200.8	Selenium
ICP-MS	EPA 6020/6020B/200.8	Thallium
ICP-MS	EPA 6020/6020B/200.8	Uranium
ICP-MS	EPA 6020/6020B/200.8	Vanadium
ICP-MS	EPA 6020/6020B/200.8	Zinc
CVAAS	EPA 7470A/245.1	Mercury
GC/MS	EPA 8260B/8260D/624.1	1,1,1,2-Tetrachloroethane

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260B/8260D/624.1	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260D/624.1	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260D/624.1	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/8260D/624.1	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260D/624.1	1,1-Dichloroethane
GC/MS	EPA 8260B/8260D/624.1	1,1-Dichloroethene
GC/MS	EPA 8260B/8260D/624.1	1,1-Dichloropropene
GC/MS	EPA 8260B/8260D/624.1	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260D/624.1	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260D/624.1	1,2,3-Trimethylbenzene
GC/MS	EPA 8260B/8260D/624.1	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260D/624.1	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260D/624.1	1,2-Dibromo-3-Chloropropane
GC/MS	EPA 8260B/8260D/624.1	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260D/624.1	1,2-Dichloroethane
GC/MS	EPA 8260B/8260D/624.1	1,2-Dichloropropane
GC/MS	EPA 8260B/8260D/624.1	1,3-Dichloropropene, Total
GC/MS	EPA 8260B/8260D/624.1	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260D/624.1	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260D/624.1	1,3-Dichloropropane
GC/MS	EPA 8260B/8260D/624.1	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260D/624.1	2,2-Dichloropropane
GC/MS	EPA 8260B/8260D/624.1	2-Chloroethylvinylether
GC/MS	EPA 8260B/8260D/624.1	2-Chlorotoluene
GC/MS	EPA 8260B/8260D/624.1	2-Hexanone
GC/MS	EPA 8260B/8260D/624.1	2-Methyl-2-Propanol
GC/MS	EPA 8260B/8260D/624.1	4-Chlorotoluene
GC/MS	EPA 8260B/8260D/624.1	4-Isopropyltoluene
GC/MS	EPA 8260B/8260D/624.1	Acetone
GC/MS	EPA 8260B/8260D/624.1	Acetonitrile
GC/MS	EPA 8260B/8260D/624.1	Acrolein
GC/MS	EPA 8260B/8260D/624.1	Acrylonitrile
GC/MS	EPA 8260B/8260D/624.1	Benzene
GC/MS	EPA 8260B/8260D/624.1	Bromobenzene
GC/MS	EPA 8260B/8260D/624.1	Bromodichloromethane

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260D/624.1	Bromoform
GC/MS	EPA 8260B/8260D/624.1	Bromomethane
GC/MS	EPA 8260B/8260D/624.1	Carbon disulfide
GC/MS	EPA 8260B/8260D/624.1	Carbon tetrachloride
GC/MS	EPA 8260B/8260D/624.1	Chlorobenzene
GC/MS	EPA 8260B/8260D/624.1	Chlorobromomethane
GC/MS	EPA 8260B/8260D/624.1	Chlorodibromomethane
GC/MS	EPA 8260B/8260D/624.1	Chloroethane
GC/MS	EPA 8260B/8260D/624.1	Chloroform
GC/MS	EPA 8260B/8260D/624.1	Chloromethane
GC/MS	EPA 8260B/8260D/624.1	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/8260D/624.1	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260D/624.1	Cyclohexane
GC/MS	EPA 8260B/8260D/624.1	Dibromomethane
GC/MS	EPA 8260B/8260D/624.1	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260D/624.1	Ethylbenzene
GC/MS	EPA 8260B/8260D/624.1	Ethylene Dibromide
GC/MS	EPA 8260B/8260D/624.1	Ethyl ether
GC/MS	EPA 8260B/8260D/624.1	Hexachlorobutadiene
GC/MS	EPA 8260B/8260D/624.1	Isopropylbenzene
GC/MS	EPA 8260B/8260D/624.1	Iodomethane
GC/MS	EPA 8260B/8260D/624.1	Isopropyl ether
GC/MS	EPA 8260B/8260D/624.1	Methacrylonitrile
GC/MS	EPA 8260B/8260D/624.1	Methyl acetate
GC/MS	EPA 8260B/8260D/624.1	Methyl Ethyl Ketone
GC/MS	EPA 8260B/8260D/624.1	Methyl Isobutyl Ketone
GC/MS	EPA 8260B/8260D/624.1	Methyl tert-butyl ether
GC/MS	EPA 8260B/8260D/624.1	Methylcyclohexane
GC/MS	EPA 8260B/8260D/624.1	Methylene Chloride
GC/MS	EPA 8260B/8260D/624.1	m-Xylene & p-Xylene
GC/MS	EPA 8260B/8260D/624.1	Naphthalene
GC/MS	EPA 8260B/8260D/624.1	n-Butanol
GC/MS	EPA 8260B/8260D/624.1	n-Butylbenzene
GC/MS	EPA 8260B/8260D/624.1	n-Hexane
GC/MS	EPA 8260B/8260D/624.1	N-Propylbenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260D/624.1	o-Xylene
GC/MS	EPA 8260B/8260D/624.1	sec-Butylbenzene
GC/MS	EPA 8260B/8260D/624.1	Styrene
GC/MS	EPA 8260B/8260D/624.1	tert-Butylbenzene
GC/MS	EPA 8260B/8260D/624.1	Tert-amyl methyl ether
GC/MS	EPA 8260B/8260D/624.1	Tert-butyl ethyl ether
GC/MS	EPA 8260B/8260D/624.1	Tetrachloroethene
GC/MS	EPA 8260B/8260D/624.1	Tetrahydrofuran
GC/MS	EPA 8260B/8260D/624.1	Toluene
GC/MS	EPA 8260B/8260D/624.1	Total Xylenes
GC/MS	EPA 8260B/8260D/624.1	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/8260D/624.1	trans-1,3-Dichloropropene
GC/MS	EPA 8260B/8260D/624.1	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260B/8260D/624.1	Trichloroethene
GC/MS	EPA 8260B/8260D/624.1	Trichlorofluoromethane
GC/MS	EPA 8260B/8260D/624.1	Vinyl Acetate
GC/MS	EPA 8260B/8260D/624.1	Vinyl chloride
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1,1,2-Tetrachloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1,2,2-Tetrachloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1,2-Trichloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1-Dichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,2,4-Trimethylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,2-Dichloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,3,5-Trimethylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,4-Dichlorobenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	2-Hexanone
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Benzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Bromoform
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Bromomethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Butadiene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Chlorodibromomethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Chloroform
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	cis-1,2-Dichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	cis-1,3-Dichloropropene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Ethylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Dibromomethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Bromodichloromethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Ethylene Dibromide
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Hexachlorobutadiene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Isopropylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Isopropyl alcohol
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	m&p-Xylene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Methyl tert-Butyl Ether
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Naphthalene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	n-Butylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	o-Xylene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Sec-Butylbenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Tert-Butylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Tetrachloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Toluene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	trans-1,3-Dichloropropene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Trichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Vinyl chloride
GC/MS	EPA 8270C/8270E/625.1	1-Methylnaphthalene
GC/MS	EPA 8270C/8270E/625.1	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/8270E/625.1	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/8270E/625.1	1,2-Dichlorobenzene
GC/MS	EPA 8270C/8270E/625.1	1,3-Dichlorobenzene
GC/MS	EPA 8270C/8270E/625.1	1,4-Dichlorobenzene
GC/MS	EPA 8270C/8270E/625.1	bis(2-chloroisopropyl)ether
GC/MS	EPA 8270C/8270E/625.1	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/8270E/625.1	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/8270E/625.1	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/8270E/625.1	2,4-Dichlorophenol
GC/MS	EPA 8270C/8270E/625.1	2,4-Dimethylphenol
GC/MS	EPA 8270C/8270E/625.1	2,4-Dinitrophenol
GC/MS	EPA 8270C/8270E/625.1	2,4-Dinitrotoluene
GC/MS	EPA 8270C/8270E/625.1	2,6-Dinitrotoluene
GC/MS	EPA 8270C/8270E/625.1	2-Chloronaphthalene
GC/MS	EPA 8270C/8270E/625.1	2-Chlorophenol
GC/MS	EPA 8270C/8270E/625.1	2-Methylnaphthalene
GC/MS	EPA 8270C/8270E/625.1	2-Methylphenol
GC/MS	EPA 8270C/8270E/625.1	2-Nitroaniline
GC/MS	EPA 8270C/8270E/625.1	2-Nitrophenol
GC/MS	EPA 8270C/8270E/625.1	3 & 4 Methylphenol
GC/MS	EPA 8270C/8270E/625.1	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/8270E/625.1	3-Nitroaniline
GC/MS	EPA 8270C/8270E/625.1	4,6-Dinitro-2-methylphenol

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8270C/8270E/625.1	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/8270E/625.1	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/8270E/625.1	4-Chloroaniline
GC/MS	EPA 8270C/8270E/625.1	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/8270E/625.1	4-Nitroaniline
GC/MS	EPA 8270C/8270E/625.1	4-Nitrophenol
GC/MS	EPA 8270C/8270E/625.1	Acenaphthene
GC/MS	EPA 8270C/8270E/625.1	Acenaphthylene
GC/MS	EPA 8270C/8270E/625.1	Aniline
GC/MS	EPA 8270C/8270E/625.1	Anthracene
GC/MS	EPA 8270C/8270E/625.1	1,2-Diphenylhydrazine as Azobenzene
GC/MS	EPA 8270C/8270E/625.1	Benzo[a]anthracene
GC/MS	EPA 8270C/8270E/625.1	Benzo[a]pyrene
GC/MS	EPA 8270C/8270E/625.1	Benzo[b]fluoranthene
GC/MS	EPA 8270C/8270E/625.1	Benzo[g,h,i]perylene
GC/MS	EPA 8270C/8270E/625.1	Benzo[k]fluoranthene
GC/MS	EPA 8270C/8270E/625.1	Benzoic acid
GC/MS	EPA 8270C/8270E/625.1	Benzyl alcohol
GC/MS	EPA 8270C/8270E/625.1	Bis(2-chloroethoxy)methane
GC/MS	EPA 8270C/8270E/625.1	Bis(2-chloroethyl)ether
GC/MS	EPA 8270C/8270E/625.1	Bis(2-ethylhexyl) phthalate
GC/MS	EPA 8270C/8270E/625.1	Butyl benzyl phthalate
GC/MS	EPA 8270C/8270E/625.1	Carbazole
GC/MS	EPA 8270C/8270E/625.1	Chrysene
GC/MS	EPA 8270C/8270E/625.1	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/8270E/625.1	Dibenzofuran
GC/MS	EPA 8270C/8270E/625.1	Diethyl phthalate
GC/MS	EPA 8270C/8270E/625.1	Dimethyl phthalate
GC/MS	EPA 8270C/8270E/625.1	Di-n-butyl phthalate
GC/MS	EPA 8270C/8270E/625.1	Di-n-octyl phthalate
GC/MS	EPA 8270C/8270E/625.1	Fluoranthene
GC/MS	EPA 8270C/8270E/625.1	Fluorene
GC/MS	EPA 8270C/8270E/625.1	Hexachlorobenzene
GC/MS	EPA 8270C/8270E/625.1	Hexachlorobutadiene
GC/MS	EPA 8270C/8270E/625.1	Hexachlorocyclopentadiene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270E/625.1	Hexachloroethane
GC/MS	EPA 8270C/8270E/625.1	Indeno[1,2,3-cd]pyrene
GC/MS	EPA 8270C/8270E/625.1	Isophorone
GC/MS	EPA 8270C/8270E/625.1	Naphthalene
GC/MS	EPA 8270C/8270E/625.1	Nitrobenzene
GC/MS	EPA 8270C/8270E/625.1	N-Nitrosodimethylamine
GC/MS	EPA 8270C/8270E/625.1	N-Nitrosodi-n-propylamine
GC/MS	EPA 8270C/8270E/625.1	N-Nitrosodiphenylamine
GC/MS	EPA 8270C/8270E/625.1	Pentachlorophenol
GC/MS	EPA 8270C/8270E/625.1	Phenanthrene
GC/MS	EPA 8270C/8270E/625.1	Phenol
GC/MS	EPA 8270C/8270E/625.1	Pyrene
GC/MS	EPA 8270C/8270E/625.1	Pyridine
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	1-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	1,4-Dioxane
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	2-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Acenaphthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Acenaphthylene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[a]anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[a]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[b]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[g,h,i]perylene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[k]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Bis(2-ethylhexyl) phthalate

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Chrysene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Dibenz(a,h)anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Fluorene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Indeno[1,2,3-cd]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Naphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Pentachlorophenol
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Phenanthrene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Pyrene
GC-ECD	EPA 8011/504.1	1,2-Dibromoethane
GC-ECD	EPA 8011/504.1	1,2-Dibromo-3-Chloropropane
GC-ECD	EPA 8011/504.1	1,2,3-Trichloropropane
GC-ECD	EPA 8081A/8081B/608.3	2,4’-DDD
GC-ECD	EPA 8081A/8081B/608.3	2,4’-DDE
GC-ECD	EPA 8081A/8081B/608.3	2,4’-DDT
GC-ECD	EPA 8081A/8081B/608.3	Aldrin
GC-ECD	EPA 8081A/8081B/608.3	alpha-BHC
GC-ECD	EPA 8081A/8081B/608.3	beta-BHC
GC-ECD	EPA 8081A/8081B/608.3	Cis-Nonachlor
GC-ECD	EPA 8081A/8081B/608.3	delta-BHC
GC-ECD	EPA 8081A/8081B/608.3	Dieldrin
GC-ECD	EPA 8081A/8081B/608.3	Endosulfan I
GC-ECD	EPA 8081A/8081B/608.3	Endosulfan II
GC-ECD	EPA 8081A/8081B/608.3	Endosulfan sulfate
GC-ECD	EPA 8081A/8081B/608.3	Endrin
GC-ECD	EPA 8081A/8081B/608.3	Endrin aldehyde
GC-ECD	EPA 8081A/8081B/608.3	Endrin ketone
GC-ECD	EPA 8081A/8081B/608.3	gamma-BHC (Lindane)
GC-ECD	EPA 8081A/8081B/608.3	Heptachlor

Non-Potable Water		
Technology	**Method**	**Analyte**
GC-ECD	EPA 8081A/8081B/608.3	Hexachlorobenzene
GC-ECD	EPA 8081A/8081B/608.3	Hexachlorobutadiene
GC-ECD	EPA 8081A/8081B/608.3	Methoxychlor
GC-ECD	EPA 8081A/8081B/608.3	Mirex
GC-ECD	EPA 8081A/8081B/608.3	Oxy-Chlordane
GC-ECD	EPA 8081A/8081B/608.3	Technical Chlordane
GC-ECD	EPA 8081A/8081B/608.3	Toxaphene
GC-ECD	EPA 8081A/8081B/608.3	Trans-Nonachlor
GC-ECD	EPA 8081A/8081B/608.3	4,4'-DDD
GC-ECD	EPA 8081A/8081B/608.3	4,4'-DDE
GC-ECD	EPA 8081A/8081B/608.3	4,4'-DDT
GC-ECD	EPA 8081A/8081B/608.3	alpha-Chlordane
GC-ECD	EPA 8081A/8081B/608.3	gamma-Chlordane
GC-ECD	EPA 8081A/8081B/608.3	Heptachlor epoxide
GC-ECD	EPA 8082/8082A/608.3	PCB-1016
GC-ECD	EPA 8082/8082A/608.3	PCB-1221
GC-ECD	EPA 8082/8082A/608.3	PCB-1232
GC-ECD	EPA 8082/8082A/608.3	PCB-1242
GC-ECD	EPA 8082/8082A/608.3	PCB-1248
GC-ECD	EPA 8082/8082A/608.3	PCB-1254
GC-ECD	EPA 8082/8082A/608.3	PCB-1260
GC-ECD	EPA 8082/8082A/608.3	PCB-1262
GC-ECD	EPA 8082/8082A/608.3	PCB-1268
GC-FID	EPA 8015B/8015D	Gasoline
GC/MS	EPA 8260B	Gasoline
GC-FID	AK101	Gasoline
GC/MS	AK101	Gasoline
GC-FID	NWTPH-Gx	Gasoline
GC/MS	NWTPH-Gx	Gasoline
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C5-C6)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C6-C8)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C8-C10)

Non-Potable Water		
Technology	**Method**	**Analyte**
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C10-C12)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aromatic HCs >C8-C10)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aromatic HCs >C10-C12)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aromatic HCs >C12-C13)
GC-FID	EPA 8015B/8015D	Diesel
GC-FID	AK102	Diesel
GC-FID	NWTPH-Dx	Diesel
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic C8-C10)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C10-C12)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C12-C16)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C16-C21)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C21-C34)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic C8-C10)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C10-C12)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C12-C16)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C16-C21)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C21-C34)
GC-FID	EPA 8015B/8015D	Motor Oil
GC-FID	AK103	Motor Oil
GC-FID	NWTPH-Dx	Motor Oil
GC/MS	Organotins	Dibutyltin
GC/MS	Organotins	Monobutyltin
GC/MS	Organotins	Tetra-n-butyltin
GC/MS	Organotins	Tributyltin

Non-Potable Water		
Technology	**Method**	**Analyte**
Titration	EPA 310.1 / SM 2320B	Alkalinity
Titration	EPA 310.1 / SM 2320B	Carbonate Alkalinity
Titration	EPA 310.1 / SM 2320B	Bicarbonate Alkalinity
Colorimetric/ RFA	EPA 350.1/ SM 4500-NH3-G	Ammonia
Colorimetric / RFA	EPA 353.2	Nitrate + Nitrite
Probe	EPA 405.1 / SM 5210B	BOD
Titration	EPA 410.2 SM 5220C	COD
Colorimetric / RFA	SM 5220D 22nd Ed	COD
Gravimetric	EPA 1664A	Oil & Grease
Colorimetric/RFA	EPA 9012A	Total Cyanides
Colorimetric/RFA	EPA 9012B	Total Cyanides
Ion Chromatography	EPA 300.0/9056A	Bromide
Ion Chromatography	EPA 300.0/9056A	Chloride
Ion Chromatography	EPA 300.0/9056A	Fluoride
Ion Chromatography	EPA 300.0/9056A	Sulfate
Ion Chromatography	EPA 300.0/9056A	Nitrate
Ion Chromatography	EPA 300.0/9056A	Nitrite
TOC Analyzer (Combustion)	EPA 415.1/9060/9060A SM 5310B	TOC
TOC Analyzer (Combustion)	EPA 415.1/9060/9060A SM 5310B	DOC
Probe	EPA 9040B/9045C/150.1	pH
Gravimetric	EPA 160.1 SM 2540C	Total Dissolved Solids
Gravimetric	EPA 160.2 SM 2540D	Total Suspended Solids
Conductivity meter	EPA 120.1 SM 2510B	Specific Conductance
Setaflash	EPA 1020A	Flashpoint
CVGCAFS	EPA 1630	Methyl Mercury
CVAFS	EPA 1631E	Mercury
CVGCAA	EPA 1632A	Arsenite
CVGCAA	EPA 1632A	Inorganic Arsenic

Non-Potable Water		
Preparation	**Method**	**Type**
Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	Semivolatile and Nonvolatile Organics
Purge and Trap	EPA 5030B	Volatile Organic Compounds
Acid Digestion (Aqueous)	EPA 3005A/3010A	Inorganics
TCLP Extraction	EPA 1311	Toxicity Characteristic Leaching Procedure
Florisil Cleanup	EPA 3620B	Cleanup of pesticide residues and other chlorinated hydrocarbons
Silica Gel Cleanup	EPA 3630C	Column Cleanup
Sulfur Cleanup	EPA 3660B	Sulfur Cleanup Reagent
Sulfuric Acid Cleanup	EPA 3665A	Cleanup for Quantization of PCBs

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010D	Silver
ICP-AES	EPA 6010B/6010D	Aluminum
ICP-AES	EPA 6010B/6010D	Arsenic
ICP-AES	EPA 6010B/6010D	Boron
ICP-AES	EPA 6010B/6010D	Barium
ICP-AES	EPA 6010B/6010D	Beryllium
ICP-AES	EPA 6010B/6010D	Calcium
ICP-AES	EPA 6010B/6010D	Cadmium
ICP-AES	EPA 6010B/6010D	Cobalt
ICP-AES	EPA 6010B/6010D	Chromium
ICP-AES	EPA 6010B/6010D	Copper
ICP-AES	EPA 6010B/6010D	Iron
ICP-AES	EPA 6010B/6010D	Potassium
ICP-AES	EPA 6010B/6010D	Magnesium
ICP-AES	EPA 6010B/6010D	Manganese
ICP-AES	EPA 6010B/6010D	Molybdenum
ICP-AES	EPA 6010B/6010D	Sodium
ICP-AES	EPA 6010B/6010D	Nickel
ICP-AES	EPA 6010B/6010D	Lead
ICP-AES	EPA 6010B/6010D	Antimony
ICP-AES	EPA 6010B/6010D	Selenium
ICP-AES	EPA 6010B/6010D	Silicon

Solid and Chemical Materials

Technology	Method	Analyte
ICP-AES	EPA 6010B/6010D	Tin
ICP-AES	EPA 6010B/6010D	Titanium
ICP-AES	EPA 6010B/6010D	Strontium
ICP-AES	EPA 6010B/6010D	Thallium
ICP-AES	EPA 6010B/6010D	Vanadium
ICP-AES	EPA 6010B/6010D	Zinc
ICP-MS	EPA 6020/6020B	Silver
ICP-MS	EPA 6020/6020B	Aluminum
ICP-MS	EPA 6020/6020B	Arsenic
ICP-MS	EPA 6020/6020B	Barium
ICP-MS	EPA 6020/6020B	Beryllium
ICP-MS	EPA 6020/6020B	Cadmium
ICP-MS	EPA 6020/6020B	Cobalt
ICP-MS	EPA 6020/6020B	Chromium
ICP-MS	EPA 6020/6020B	Copper
ICP-MS	EPA 6020/6020B	Iron
ICP-MS	EPA 6020/6020B	Manganese
ICP-MS	EPA 6020/6020B	Molybdenum
ICP-MS	EPA 6020/6020B	Nickel
ICP-MS	EPA 6020/6020B	Lead
ICP-MS	EPA 6020/6020B	Antimony
ICP-MS	EPA 6020/6020B	Selenium
ICP-MS	EPA 6020/6020B	Thallium
ICP-MS	EPA 6020/6020B	Uranium
ICP-MS	EPA 6020/6020B	Vanadium
ICP-MS	EPA 6020/6020B	Zinc
CVAAS	EPA 7471A/7471B	Mercury
GC/MS	EPA 8260B/8260D	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260D	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260D	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260D	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/8260D	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260D	1,1-Dichloroethane
GC/MS	EPA 8260B/8260D	1,1-Dichloroethene
GC/MS	EPA 8260B/8260D	1,1-Dichloropropene

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8260B/8260D	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260D	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260D	1,2,3-Trimethylbenzene
GC/MS	EPA 8260B/8260D	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260D	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260D	1,2-Dibromo-3-Chloropropane
GC/MS	EPA 8260B/8260D	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260D	1,2-Dichloroethane
GC/MS	EPA 8260B/8260D	1,2-Dichloropropane
GC/MS	EPA 8260B/8260D	1,3-Dichloropropene, Total
GC/MS	EPA 8260B/8260D	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260D	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260D	1,3-Dichloropropane
GC/MS	EPA 8260B/8260D	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260D	2,2-Dichloropropane
GC/MS	EPA 8260B/8260D	2-Chloroethylvinylether
GC/MS	EPA 8260B/8260D	2-Chlorotoluene
GC/MS	EPA 8260B/8260D	2-Hexanone
GC/MS	EPA 8260B/8260D	2-Methyl-2-Propanol
GC/MS	EPA 8260B/8260D	4-Chlorotoluene
GC/MS	EPA 8260B/8260D	4-Isopropyltoluene
GC/MS	EPA 8260B/8260D	Acetone
GC/MS	EPA 8260B/8260D	Acetonitrile
GC/MS	EPA 8260B/8260D	Acrolein
GC/MS	EPA 8260B/8260D	Acrylonitrile
GC/MS	EPA 8260B/8260D	Benzene
GC/MS	EPA 8260B/8260D	Bromobenzene
GC/MS	EPA 8260B/8260D	Bromodichloromethane
GC/MS	EPA 8260B/8260D	Bromoform
GC/MS	EPA 8260B/8260D	Bromomethane
GC/MS	EPA 8260B/8260D	Carbon disulfide
GC/MS	EPA 8260B/8260D	Carbon tetrachloride
GC/MS	EPA 8260B/8260D	Chlorobenzene
GC/MS	EPA 8260B/8260D	Chlorobromomethane
GC/MS	EPA 8260B/8260D	Chlorodibromomethane

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260D	Chloroethane
GC/MS	EPA 8260B/8260D	Chloroform
GC/MS	EPA 8260B/8260D	Chloromethane
GC/MS	EPA 8260B/8260D	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/8260D	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260D	Cyclohexane
GC/MS	EPA 8260B/8260D	Dibromomethane
GC/MS	EPA 8260B/8260D	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260D	Ethylbenzene
GC/MS	EPA 8260B/8260D	Ethylene Dibromide
GC/MS	EPA 8260B/8260D	Ethyl ether
GC/MS	EPA 8260B/8260D	Hexachlorobutadiene
GC/MS	EPA 8260B/8260D	Isopropylbenzene
GC/MS	EPA 8260B/8260D	Iodomethane
GC/MS	EPA 8260B/8260D	Isopropyl ether
GC/MS	EPA 8260B/8260D	Methacrylonitrile
GC/MS	EPA 8260B/8260D	Methyl acetate
GC/MS	EPA 8260B/8260D	Methyl Ethyl Ketone
GC/MS	EPA 8260B/8260D	Methyl Isobutyl Ketone
GC/MS	EPA 8260B/8260D	Methyl tert-butyl ether
GC/MS	EPA 8260B/8260D	Methylcyclohexane
GC/MS	EPA 8260B/8260D	Methylene Chloride
GC/MS	EPA 8260B/8260D	m-Xylene & p-Xylene
GC/MS	EPA 8260B/8260D	Naphthalene
GC/MS	EPA 8260B/8260D	n-Butanol
GC/MS	EPA 8260B/8260D	n-Butylbenzene
GC/MS	EPA 8260B/8260D	n-Hexane
GC/MS	EPA 8260B/8260D	N-Propylbenzene
GC/MS	EPA 8260B/8260D	o-Xylene
GC/MS	EPA 8260B/8260D	sec-Butylbenzene
GC/MS	EPA 8260B/8260D	Styrene
GC/MS	EPA 8260B/8260D	tert-Butylbenzene
GC/MS	EPA 8260B/8260D	Tert-amyl methyl ether
GC/MS	EPA 8260B/8260D	Tert-butyl ethyl ether
GC/MS	EPA 8260B/8260D	Tetrachloroethene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260D	Tetrahydrofuran
GC/MS	EPA 8260B/8260D	Toluene
GC/MS	EPA 8260B/8260D	Total Xylenes
GC/MS	EPA 8260B/8260D	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/8260D	trans-1,3-Dichloropropene
GC/MS	EPA 8260B/8260D	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260B/8260D	Trichloroethene
GC/MS	EPA 8260B/8260D	Trichlorofluoromethane
GC/MS	EPA 8260B/8260D	Vinyl Acetate
GC/MS	EPA 8260B/8260D	Vinyl chloride
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1,1,2-Tetrachloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1,2,2-Tetrachloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1,2-Trichloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,2,4-Trimethylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1, 2-Dibromoethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,1-Dichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,2-Dichloroethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,3,5-Trimethylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	1,4-Dichlorobenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	2-Hexanone
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Benzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Bromoform
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Bromomethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Butadiene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Chlorodibromomethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Chloroform
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	cis-1,2-Dichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	cis-1,3-Dichloropropene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Dibromomethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Ethylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Bromodichloromethane
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Ethylene Dibromide
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Hexachlorobutadiene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Isopropylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Isopropyl alcohol
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	m&p-Xylene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Methyl tert-Butyl Ether
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Naphthalene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	n-Butylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	o-Xylene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Sec-Butylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Tert-Butylbenzene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Tetrachloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Toluene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Trans-1,2-Dichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	trans-1,3-Dichloropropene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Trichloroethene
GC/MS SIM	EPA 8260B SIM EPA 8260D SIM	Vinyl chloride
GC/MS	EPA 8270C/8270E	1-Methylnaphthalene
GC/MS	EPA 8270C/8270E	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/8270E	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/8270E	1,2-Dichlorobenzene
GC/MS	EPA 8270C/8270E	1,3-Dichlorobenzene
GC/MS	EPA 8270C/8270E	1,4-Dichlorobenzene
GC/MS	EPA 8270C/8270E	bis(2-chloroisopropyl)ether
GC/MS	EPA 8270C/8270E	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/8270E	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/8270E	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/8270E	2,4-Dichlorophenol
GC/MS	EPA 8270C/8270E	2,4-Dimethylphenol
GC/MS	EPA 8270C/8270E	2,4-Dinitrophenol
GC/MS	EPA 8270C/8270E	2,4-Dinitrotoluene
GC/MS	EPA 8270C/8270E	2,6-Dinitrotoluene
GC/MS	EPA 8270C/8270E	2-Chloronaphthalene
GC/MS	EPA 8270C/8270E	2-Chlorophenol
GC/MS	EPA 8270C/8270E	2-Methylnaphthalene
GC/MS	EPA 8270C/8270E	2-Methylphenol
GC/MS	EPA 8270C/8270E	2-Nitroaniline
GC/MS	EPA 8270C/8270E	2-Nitrophenol
GC/MS	EPA 8270C/8270E	3 & 4 Methylphenol
GC/MS	EPA 8270C/8270E	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/8270E	3-Nitroaniline
GC/MS	EPA 8270C/8270E	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/8270E	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/8270E	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/8270E	4-Chloroaniline

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8270C/8270E	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/8270E	4-Nitroaniline
GC/MS	EPA 8270C/8270E	4-Nitrophenol
GC/MS	EPA 8270C/8270E	Acenaphthene
GC/MS	EPA 8270C/8270E	Acenaphthylene
GC/MS	EPA 8270C/8270E	Aniline
GC/MS	EPA 8270C/8270E	Anthracene
GC/MS	EPA 8270C/8270E	1,2-Diphenylhydrazine as Azobenzene
GC/MS	EPA 8270C/8270E	Benzo[a]anthracene
GC/MS	EPA 8270C/8270E	Benzo[a]pyrene
GC/MS	EPA 8270C/8270E	Benzo[b]fluoranthene
GC/MS	EPA 8270C/8270E	Benzo[g,h,i]perylene
GC/MS	EPA 8270C/8270E	Benzo[k]fluoranthene
GC/MS	EPA 8270C/8270E	Benzoic acid
GC/MS	EPA 8270C/8270E	Benzyl alcohol
GC/MS	EPA 8270C/8270E	Bis(2-chloroethoxy)methane
GC/MS	EPA 8270C/8270E	Bis(2-chloroethyl)ether
GC/MS	EPA 8270C/8270E	Bis(2-ethylhexyl) phthalate
GC/MS	EPA 8270C/8270E	Butyl benzyl phthalate
GC/MS	EPA 8270C/8270E	Carbazole
GC/MS	EPA 8270C/8270E	Chrysene
GC/MS	EPA 8270C/8270E	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/8270E	Dibenzofuran
GC/MS	EPA 8270C/8270E	Diethyl phthalate
GC/MS	EPA 8270C/8270E	Dimethyl phthalate
GC/MS	EPA 8270C/8270E	Di-n-butyl phthalate
GC/MS	EPA 8270C/8270E	Di-n-octyl phthalate
GC/MS	EPA 8270C/8270E	Fluoranthene
GC/MS	EPA 8270C/8270E	Fluorene
GC/MS	EPA 8270C/8270E	Hexachlorobenzene
GC/MS	EPA 8270C/8270E	Hexachlorobutadiene
GC/MS	EPA 8270C/8270E	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/8270E	Hexachloroethane
GC/MS	EPA 8270C/8270E	Indeno[1,2,3-cd]pyrene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270E	Isophorone
GC/MS	EPA 8270C/8270E	Naphthalene
GC/MS	EPA 8270C/8270E	Nitrobenzene
GC/MS	EPA 8270C/8270E	N-Nitrosodimethylamine
GC/MS	EPA 8270C/8270E	N-Nitrosodi-n-propylamine
GC/MS	EPA 8270C/8270E	N-Nitrosodiphenylamine
GC/MS	EPA 8270C/8270E	Pentachlorophenol
GC/MS	EPA 8270C/8270E	Phenanthrene
GC/MS	EPA 8270C/8270E	Phenol
GC/MS	EPA 8270C/8270E	Pyrene
GC/MS	EPA 8270C/8270E	Pyridine
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	1-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	1,4-Dioxane
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	2-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Acenaphthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Acenaphthylene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[a]anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[a]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[b]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[g,h,i]perylene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Benzo[k]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Bis(2-ethylhexyl) phthalate
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Chrysene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Dibenz(a,h)anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Fluorene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Indeno[1,2,3-cd]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Naphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Pentachlorophenol
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Phenanthrene
GC/MS SIM	EPA 8270C SIM EPA 8270E SIM	Pyrene
GC-ECD	EPA 8011	1,2-Dibromoethane
GC-ECD	EPA 8011	1,2-Dibromo-3-Chloropropane
GC-ECD	EPA 8011	1,2,3-Trichloropropane
GC-ECD	EPA 8081A/8081B	2,4'-DDD
GC-ECD	EPA 8081A/8081B	2,4'-DDE
GC-ECD	EPA 8081A/8081B	2,4'-DDT
GC-ECD	EPA 8081A/8081B	4,4'-DDD
GC-ECD	EPA 8081A/8081B	4,4'-DDE
GC-ECD	EPA 8081A/8081B	4,4'-DDT
GC-ECD	EPA 8081A/8081B	Aldrin
GC-ECD	EPA 8081A/8081B	alpha-BHC
GC-ECD	EPA 8081A/8081B	alpha-Chlordane
GC-ECD	EPA 8081A/8081B	beta-BHC
GC-ECD	EPA 8081A/8081B	delta-BHC
GC-ECD	EPA 8081A/8081B	Cis-Nonchlor
GC-ECD	EPA 8081A/8081B	Dieldrin
GC-ECD	EPA 8081A/8081B	Endosulfan I
GC-ECD	EPA 8081A/8081B	Endosulfan II
GC-ECD	EPA 8081A/8081B	Endosulfan sulfate
GC-ECD	EPA 8081A/8081B	Endrin

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC-ECD	EPA 8081A/8081B	Endrin aldehyde
GC-ECD	EPA 8081A/8081B	Endrin ketone
GC-ECD	EPA 8081A/8081B	gamma-BHC (Lindane)
GC-ECD	EPA 8081A/8081B	gamma-Chlordane
GC-ECD	EPA 8081A/8081B	Heptachlor
GC-ECD	EPA 8081A/8081B	Heptachlor epoxide
GC-ECD	EPA 8081A/8081B	Hexachlorobenzene
GC-ECD	EPA 8081A/8081B	Hexachlorobutadiene
GC-ECD	EPA 8081A/8081B	Methoxychlor
GC-ECD	EPA 8081A/8081B	Mirex
GC-ECD	EPA 8081A/8081B	Oxy-Chlordane
GC-ECD	EPA 8081A/8081B	Technical Chlordane
GC-ECD	EPA 8081A/8081B	Toxaphene
GC-ECD	EPA 8081A/8081B	Trans-Nonachlor
GC-ECD	EPA 8082/8082A	PCB-1016
GC-ECD	EPA 8082/8082A	PCB-1221
GC-ECD	EPA 8082/8082A	PCB-1232
GC-ECD	EPA 8082/8082A	PCB-1242
GC-ECD	EPA 8082/8082A	PCB-1248
GC-ECD	EPA 8082/8082A	PCB-1254
GC-ECD	EPA 8082/8082A	PCB-1260
GC-ECD	EPA 8082/8082A	PCB-1262
GC-ECD	EPA 8082/8082A	PCB-1268
GC-FID	EPA 8015B/8015D	Gasoline
GC/MS	EPA 8260B	Gasoline
GC-FID	AK101	Gasoline
GC/MS	AK101	Gasoline
GC-FID	NWTPH-Gx	Gasoline
GC/MS	NWTPH-Gx	Gasoline
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C5-C6)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C6-C8)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C8-C10)

Solid and Chemical Materials

Technology	Method	Analyte
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aliphatic HCs >C10-C12)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aromatic HCs >C8-C10)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aromatic HCs >C10-C12)
GC-FID	NWVPH	Volatile Petroleum Hydrocarbons (aromatic HCs >C12-C13)
GC-FID	EPA 8015B/8015D	Diesel
GC-FID	AK102	Diesel
GC-FID	NWTPH-Dx	Diesel
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic C8-C10)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C10-C12)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C12-C16)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C16-C21)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aliphatic >C21-C34)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic 8-C10)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C10-C12)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C12-C16)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C16-C21)
GC-FID	NWEPH	Extractable Petroleum Hydrocarbons (aromatic >C21-C34)
GC-FID	EPA 8015B/8015D	Motor Oil
GC-FID	AK103	Motor Oil
GC-FID	NWTPH-Dx	Motor Oil
GC/MS	Organotins	Dibutyltin
GC/MS	Organotins	Monobutyltin
GC/MS	Organotins	Tetra-n-butyltin

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	Organotins	Tributyltin
Gravimetric	ASTM D422-63/D7928/D6913	Grain Size
Colorimetric/RFA	EPA 9012A	Total Cyanides
Colorimetric/RFA	EPA 9012B	Total Cyanides
Colorimetric/RFA	EPA 350.1	Ammonia
Ion Chromatography	EPA 300.0/9056A	Bromide
Ion Chromatography	EPA 300.0/9056A	Chloride
Ion Chromatography	EPA 300.0/9056A	Fluoride
Ion Chromatography	EPA 300.0/9056A	Sulfate
Ion Chromatography	EPA 300.0/9056A	Nitrate
Ion Chromatography	EPA 300.0/9056A	Nitrite
CVGCAFS	EPA 1630 MOD/SOP 2808	Methyl Mercury
CVAFS	EPA 1631B	Mercury
CVGCAA	EPA 1632A MOD	Arsenite
CVGCAA	EPA 1632A MOD	Inorganic Arsenic
TOC Analyzer (Combustion)	EPA 9060/9060A	TOC
Probe	EPA 9040B/9045C	pH/Corrosivity
Setaflash	EPA 1020A	Flashpoint
Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	Semivolatile and Nonvolatile Organics in leachates
Microwave Extraction	EPA 3546	Semivolatile and Nonvolatile Organics
Solvent Dilution	EPA 3580A	Semivolatile and Nonvolatile Organics
Waste Dilution	EPA 3585	Volatile Organic Compounds
Purge and Trap	EPA 5030B	Volatile Organic Compounds
Purge and Trap	EPA 5035A	Volatile Organic Compounds
Acid Digestion (Aqueous)	EPA 3005A/3010A	Inorganics in leachates
Acid Digestion (Sediments, Sludges, Soils)	EPA 3050B	Inorganics
TCLP Extraction	EPA 1311	Toxicity Characteristic Leaching Procedure
Florisil Cleanup	EPA 3620B	Cleanup of pesticide residues and other chlorinated hydrocarbons
Silica Gel Cleanup	EPA 3630C	Column Cleanup
Sulfur Cleanup	EPA 3660B	Sulfur Cleanup Reagent
Sulfuric Acid Cleanup	EPA 3665A	Cleanup for Quantitation of PCBs

Air and Emissions		
Technology	**Method**	**Analyte**
CVAFS	EPA 30B EPA 12B SOP5143	Total Gaseous Mercury

Biological Tissue		
Technology	**Method**	**Analyte**
CVGCAFS	EPA 1630 MOD/SOP2808	Methyl Mercury
CVAFS	EPA 1631B	Mercury
CVGCAA	EPA 1632A	Arsenite
CVGCAA	EPA 1632A	Inorganic Arsenic

Note:

1. This scope is formatted as part of a single document including Certificate of Accreditation No. L2236.

R. Douglas Leonard Jr., VP, PILR SBU

The State of Washington
Department of Ecology

Eurofins Seattle
Tacoma, WA

has complied with provisions set forth in Chapter 173-50 WAC and is hereby recognized by the Department of Ecology as an ACCREDITED LABORATORY for the analytical parameters listed on the accompanying Scope of Accreditation. This certificate is effective July 14, 2022 and shall expire July 13, 2023.

Witnessed under my hand on July 27, 2022

Rebecca Wood
Lab Accreditation Unit Supervisor

Laboratory ID
C788

WASHINGTON STATE DEPARTMENT OF ECOLOGY

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

SCOPE OF ACCREDITATION

Eurofins Seattle

Tacoma, WA

is accredited for the analytes listed below using the methods indicated. Full accreditation is granted unless stated otherwise in a note. EPA is the U.S. Environmental Protection Agency. SM is "Standard Methods for the Examination of Water and Wastewater." SM refers to EPA approved method versions. ASTM is the American Society for Testing and Materials. USGS is the U.S. Geological Survey. AOAC is the Association of Official Analytical Chemists. Other references are described in notes.

Matrix/Analyte	Method	Notes
Drinking Water		
1,2,3-Trichloropropane	EPA 504.1_1.1_1995	7
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 504.1_1.1_1995	7
Dibromochloropropane	EPA 504.1_1.1_1995	7
Non-Potable Water		
Specific Conductance	EPA 120.1_1982	7
non-Polar Extractable Material (TPH)	EPA 1664A (SGT-HEM)	7,10
n-Hexane Extractable Material (O&G)	EPA 1664A_1_1999	7
Turbidity	EPA 180.1_2_1993	7
Bromide	EPA 300.0_2.1_1993	7
Chloride	EPA 300.0_2.1_1993	7
Fluoride	EPA 300.0_2.1_1993	7
Nitrate	EPA 300.0_2.1_1993	7
Nitrate + Nitrite	EPA 300.0_2.1_1993	7
Nitrite	EPA 300.0_2.1_1993	7
Sulfate	EPA 300.0_2.1_1993	7
Cyanide, Total	EPA 335.4_1_1993	7
Ammonia	EPA 350.1_2_1993	7
Nitrate + Nitrite	EPA 353.2_2_1993	7
Orthophosphate	EPA 365.1_2_1993	7,10
Turbidity	SM 2130 B-2011	7
Alkalinity	SM 2320 B-2011	7
Carbonate/Bicarbonate	SM 2320 B-2011	
Hardness (calc.)	SM 2340 B-2011	7
Hardness, Total (as CaCO3)	SM 2340 C-2011	7
Specific Conductance	SM 2510 B-2011	7
Salinity	SM 2520 B-2011	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
Solids, Total Dissolved	SM 2540 C-2011	7
Solids, Total Suspended	SM 2540 D-2011	7
Solids, Settleable	SM 2540 F-2011	7
Cyanide, Total	SM 4500-CN$^-$ E-2011	7
Cyanides, Amenable to Chlorination	SM 4500-CN$^-$ G-2011	7
pH	SM 4500-H+ B-2011	7
Ammonia	SM 4500-NH3 G-2011	7
Orthophosphate	SM 4500-P F-2011	7,10
Biochemical Oxygen Demand (BOD)	SM 5210 B-2011	7
Carbonaceous BOD (CBOD)	SM 5210 B-2011	7
Chemical Oxygen Demand (COD)	SM 5220 C-2011	7
Chemical Oxygen Demand (COD)	SM 5220 D-2011	7
Dissolved Organic Carbon	SM 5310 B-2011	7
Total Organic Carbon	SM 5310 B-2011	7,10
Mercury	EPA 1631 E-02	7
Arsenic (III)	EPA 1632A 1998	7
Arsenic (V)	EPA 1632A 1998	7
Aluminum	EPA 1638_1996	7
Antimony	EPA 1638_1996	7
Arsenic	EPA 1638_1996	7
Barium	EPA 1638_1996	7
Beryllium	EPA 1638_1996	7
Cadmium	EPA 1638_1996	7
Chromium	EPA 1638_1996	7
Cobalt	EPA 1638_1996	7
Copper	EPA 1638_1996	7
Iron	EPA 1638_1996	7
Lead	EPA 1638_1996	7
Manganese	EPA 1638_1996	7
Molybdenum	EPA 1638_1996	7
Nickel	EPA 1638_1996	7
Selenium	EPA 1638_1996	7
Silver	EPA 1638_1996	7
Strontium	EPA 1638_1996	7
Thallium	EPA 1638_1996	7
Tin	EPA 1638_1996	7
Titanium	EPA 1638_1996	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
Vanadium	EPA 1638_1996	7
Zinc	EPA 1638_1996	7
Aluminum	EPA 200.7_4.4_1994	7
Antimony	EPA 200.7_4.4_1994	7
Arsenic	EPA 200.7_4.4_1994	7
Barium	EPA 200.7_4.4_1994	7
Beryllium	EPA 200.7_4.4_1994	7
Boron	EPA 200.7_4.4_1994	7
Cadmium	EPA 200.7_4.4_1994	7
Calcium	EPA 200.7_4.4_1994	7
Chromium	EPA 200.7_4.4_1994	7
Cobalt	EPA 200.7_4.4_1994	7
Copper	EPA 200.7_4.4_1994	7
Hardness, Total (as CaCO3)	EPA 200.7_4.4_1994	7
Iron	EPA 200.7_4.4_1994	7
Lead	EPA 200.7_4.4_1994	7
Magnesium	EPA 200.7_4.4_1994	7
Manganese	EPA 200.7_4.4_1994	7
Molybdenum	EPA 200.7_4.4_1994	7
Nickel	EPA 200.7_4.4_1994	7
Potassium	EPA 200.7_4.4_1994	7
Selenium	EPA 200.7_4.4_1994	7
Silica	EPA 200.7_4.4_1994	7
Silicon	EPA 200.7_4.4_1994	7
Silver	EPA 200.7_4.4_1994	7
Sodium	EPA 200.7_4.4_1994	7
Strontium	EPA 200.7_4.4_1994	7
Thallium	EPA 200.7_4.4_1994	7
Tin	EPA 200.7_4.4_1994	7
Titanium	EPA 200.7_4.4_1994	7
Vanadium	EPA 200.7_4.4_1994	7
Zinc	EPA 200.7_4.4_1994	7
Aluminum	EPA 200.8_5.4_1994	7
Antimony	EPA 200.8_5.4_1994	7
Arsenic	EPA 200.8_5.4_1994	7
Barium	EPA 200.8_5.4_1994	7
Beryllium	EPA 200.8_5.4_1994	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
Cadmium	EPA 200.8_5.4_1994	7
Chromium	EPA 200.8_5.4_1994	7
Cobalt	EPA 200.8_5.4_1994	7
Copper	EPA 200.8_5.4_1994	7
Iron	EPA 200.8_5.4_1994	7
Lead	EPA 200.8_5.4_1994	7
Manganese	EPA 200.8_5.4_1994	7
Molybdenum	EPA 200.8_5.4_1994	7
Nickel	EPA 200.8_5.4_1994	7
Selenium	EPA 200.8_5.4_1994	7
Silver	EPA 200.8_5.4_1994	7
Strontium	EPA 200.8_5.4_1994	7
Thallium	EPA 200.8_5.4_1994	7
Tin	EPA 200.8_5.4_1994	7
Titanium	EPA 200.8_5.4_1994	7
Total Uranium	EPA 200.8_5.4_1994	7
Vanadium	EPA 200.8_5.4_1994	7
Zinc	EPA 200.8_5.4_1994	7
Mercury	EPA 245.1_3_1994	7
4,4'-DDD	EPA 608.3	7
4,4'-DDE	EPA 608.3	7
4,4'-DDT	EPA 608.3	7
Aldrin	EPA 608.3	7
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 608.3	7
alpha-Chlordane	EPA 608.3	7
Aroclor-1016 (PCB-1016)	EPA 608.3	7
Aroclor-1221 (PCB-1221)	EPA 608.3	7
Aroclor-1232 (PCB-1232)	EPA 608.3	7
Aroclor-1242 (PCB-1242)	EPA 608.3	7
Aroclor-1248 (PCB-1248)	EPA 608.3	7
Aroclor-1254 (PCB-1254)	EPA 608.3	7
Aroclor-1260 (PCB-1260)	EPA 608.3	7
Aroclor-1262 (PCB-1262)	EPA 608.3	7
Aroclor-1268 (PCB-1268)	EPA 608.3	7
beta-BHC (beta-Hexachlorocyclohexane)	EPA 608.3	7
Chlordane (tech.)	EPA 608.3	7
delta-BHC	EPA 608.3	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
Dieldrin	EPA 608.3	7
Endosulfan I	EPA 608.3	7
Endosulfan II	EPA 608.3	7
Endosulfan sulfate	EPA 608.3	7
Endrin	EPA 608.3	7
Endrin aldehyde	EPA 608.3	7
Endrin ketone	EPA 608.3	7
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 608.3	7
gamma-Chlordane	EPA 608.3	7
Heptachlor	EPA 608.3	7
Heptachlor epoxide	EPA 608.3	7
Methoxychlor	EPA 608.3	7
Toxaphene (Chlorinated camphene)	EPA 608.3	7
1,1,1,2-Tetrachloroethane	EPA 624.1	7
1,1,1-Trichloroethane	EPA 624.1	7
1,1,2,2-Tetrachloroethane	EPA 624.1	7
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 624.1	7
1,1,2-Trichloroethane	EPA 624.1	7
1,1-Dichloroethane	EPA 624.1	7
1,1-Dichloroethylene	EPA 624.1	7
1,1-Dichloropropene	EPA 624.1	7
1,2,3-Trichlorobenzene	EPA 624.1	7
1,2,3-Trichloropropane	EPA 624.1	7
1,2,4-Trimethylbenzene	EPA 624.1	7
1,2-Dibromo-3-chloropropane (DBCP)	EPA 624.1	7
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 624.1	7
1,2-Dichlorobenzene	EPA 624.1	7
1,2-Dichloroethane (Ethylene dichloride)	EPA 624.1	7
1,2-Dichloropropane	EPA 624.1	7
1,3,5-Trimethylbenzene	EPA 624.1	7
1,3-Dichlorobenzene	EPA 624.1	7
1,3-Dichloropropane	EPA 624.1	7
1,3-Dichloropropene	EPA 624.1	7
1,4-Dichlorobenzene	EPA 624.1	7
2,2-Dichloropropane	EPA 624.1	7
2-Butanone (Methyl ethyl ketone, MEK)	EPA 624.1	7
2-Chloroethyl vinyl ether	EPA 624.1	7

Matrix/Analyte	**Method**	**Notes**
Non-Potable Water		
2-Chlorotoluene	EPA 624.1	7
2-Hexanone	EPA 624.1	7
4-Chlorotoluene	EPA 624.1	7
4-Isopropyltoluene (p-Cymene)	EPA 624.1	7
4-Methyl-2-pentanone (MIBK)	EPA 624.1	7
Acetone	EPA 624.1	7
Acetonitrile	EPA 624.1	7
Acrolein (Propenal)	EPA 624.1	7
Acrylonitrile	EPA 624.1	7
Benzene	EPA 624.1	7
Bromobenzene	EPA 624.1	7
Bromochloromethane	EPA 624.1	7
Bromodichloromethane	EPA 624.1	7
Bromoform	EPA 624.1	7
Carbon disulfide	EPA 624.1	7
Carbon tetrachloride	EPA 624.1	7
Chlorobenzene	EPA 624.1	7
Chlorodibromomethane	EPA 624.1	7
Chloroethane (Ethyl chloride)	EPA 624.1	7
Chloroform	EPA 624.1	7
cis-1,2-Dichloroethylene	EPA 624.1	7
cis-1,3-Dichloropropene	EPA 624.1	7
Dibromomethane	EPA 624.1	7
Di-isopropylether (DIPE)	EPA 624.1	7
Ethylbenzene	EPA 624.1	7
Ethyl-t-butylether (ETBE)	EPA 624.1	7
Hexachlorobutadiene	EPA 624.1	7
Iodomethane (Methyl iodide)	EPA 624.1	7
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 624.1	7
Isopropylbenzene	EPA 624.1	7
m+p-xylene	EPA 624.1	7
Methacrylonitrile	EPA 624.1	7
Methyl bromide (Bromomethane)	EPA 624.1	7
Methyl chloride (Chloromethane)	EPA 624.1	7
Methyl tert-butyl ether (MTBE)	EPA 624.1	7
Methylcyclohexane	EPA 624.1	7
Methylene chloride (Dichloromethane)	EPA 624.1	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
n-Butyl alcohol (1-Butanol, n-Butanol)	EPA 624.1	7
n-Butylbenzene	EPA 624.1	7
n-Propylbenzene	EPA 624.1	7
o-Xylene	EPA 624.1	7
sec-Butylbenzene	EPA 624.1	7
Styrene	EPA 624.1	7
tert-Butylbenzene	EPA 624.1	7
Tetrachloroethylene (Perchloroethylene)	EPA 624.1	7
Tetrahydrofuran (THF)	EPA 624.1	7
Toluene	EPA 624.1	7
trans-1,2-Dichloroethylene	EPA 624.1	7
trans-1,3-Dichloropropylene	EPA 624.1	7
trans-1,4-Dichloro-2-butene	EPA 624.1	7
Trichloroethene (Trichloroethylene)	EPA 624.1	7
Trichlorofluoromethane (Freon 11)	EPA 624.1	7
Vinyl acetate	EPA 624.1	7
Vinyl chloride	EPA 624.1	7
Xylene (total)	EPA 624.1	7
1,2,4-Trichlorobenzene	EPA 625.1	7
1-Methylnaphthalene	EPA 625.1	7
2,2'-Oxybis(1-chloropropane)	EPA 625.1	7
2,4,5-Trichlorophenol	EPA 625.1	7
2,4,6-Trichlorophenol	EPA 625.1	7
2,4-Dichlorophenol	EPA 625.1	7
2,4-Dimethylphenol	EPA 625.1	7
2,4-Dinitrophenol	EPA 625.1	7
2,4-Dinitrotoluene (2,4-DNT)	EPA 625.1	7
2,6-Dinitrotoluene (2,6-DNT)	EPA 625.1	7
2-Chloronaphthalene	EPA 625.1	7
2-Chlorophenol	EPA 625.1	7
2-Methylnaphthalene	EPA 625.1	7
2-Methylphenol (o-Cresol)	EPA 625.1	7
2-Nitroaniline	EPA 625.1	7
2-Nitrophenol	EPA 625.1	7
3,3'-Dichlorobenzidine	EPA 625.1	7
3-Nitroaniline	EPA 625.1	7
4,6-Dinitro-2-methylphenol	EPA 625.1	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
4-Bromophenyl phenyl ether (BDE-3)	EPA 625.1	7
4-Chloro-3-methylphenol	EPA 625.1	7
4-Chloroaniline	EPA 625.1	7
4-Chlorophenyl phenylether	EPA 625.1	7
4-Nitroaniline	EPA 625.1	7
4-Nitrophenol	EPA 625.1	7
Acenaphthene	EPA 625.1	7
Acenaphthylene	EPA 625.1	7
Aniline	EPA 625.1	7
Anthracene	EPA 625.1	7
Azobenzene	EPA 625.1	7
Benzo(a)anthracene	EPA 625.1	7
Benzo(a)pyrene	EPA 625.1	7
Benzo(g,h,i)perylene	EPA 625.1	7
Benzo(k)fluoranthene	EPA 625.1	7
Benzo[b]fluoranthene	EPA 625.1	7
Benzoic acid	EPA 625.1	7
Benzyl alcohol	EPA 625.1	7
bis(2-Chloroethoxy)methane	EPA 625.1	7
bis(2-Chloroethyl) ether	EPA 625.1	7
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 625.1	7
Butyl benzyl phthalate	EPA 625.1	7
Carbazole	EPA 625.1	7
Chrysene	EPA 625.1	7
Dibenz(a,h) anthracene	EPA 625.1	7
Dibenzofuran	EPA 625.1	7
Diethyl phthalate	EPA 625.1	7
Dimethyl phthalate	EPA 625.1	7
Di-n-butyl phthalate	EPA 625.1	7
Di-n-octyl phthalate	EPA 625.1	7
Fluoranthene	EPA 625.1	7
Fluorene	EPA 625.1	7
Hexachlorobenzene	EPA 625.1	7
Hexachlorobutadiene	EPA 625.1	7
Hexachlorocyclopentadiene	EPA 625.1	7
Hexachloroethane	EPA 625.1	7
Indeno(1,2,3-cd) pyrene	EPA 625.1	7

Matrix/Analyte	Method	Notes
Non-Potable Water		
Isophorone	EPA 625.1	7
m+p Cresol	EPA 625.1	7
Naphthalene	EPA 625.1	7
n-Decane	EPA 625.1	7
Nitrobenzene	EPA 625.1	7
N-Nitrosodimethylamine	EPA 625.1	7
N-Nitroso-di-n-propylamine	EPA 625.1	7
N-Nitrosodiphenylamine	EPA 625.1	7
n-Octadecane	EPA 625.1	7
Pentachlorophenol	EPA 625.1	7
Phenanthrene	EPA 625.1	7
Phenol	EPA 625.1	7
Pyrene	EPA 625.1	7
Pyridine	EPA 625.1	7
Dibutyltin	Krone 1988	3
Monobutyltin	Krone 1988	3
Tetrabutyltin	Krone 1988	3
Tributyltin	Krone 1988	3
Gasoline range organics (GRO)	NWTPH-Gx (GC/MS)	2,7
Solid and Chemical Materials		
Percent Moisture	ASTM D2216-10	7
Bromide	EPA 300.0_2.1_1993	7
Chloride	EPA 300.0_2.1_1993	7
Fluoride	EPA 300.0_2.1_1993	7
Nitrate	EPA 300.0_2.1_1993	7
Nitrate + Nitrite	EPA 300.0_2.1_1993	1,7
Nitrite	EPA 300.0_2.1_1993	7,10
Sulfate	EPA 300.0_2.1_1993	7
Ammonia	EPA 350.1_2_1993	7
Phosphorus, Total	EPA 365.1_2_1993	7,10
Cyanide, Total	EPA 9012 B-04	7
Cyanides, Amenable to Chlorination	EPA 9012 B-04	7
pH	EPA 9045 D_2004	7
Bromide	EPA 9056A_(02/07)	7
Chloride	EPA 9056A_(02/07)	7
Fluoride	EPA 9056A_(02/07)	7
Nitrate	EPA 9056A_(02/07)	7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Nitrate + Nitrite	EPA 9056A_(02/07)	1,7
Nitrite	EPA 9056A_(02/07)	7,10
Sulfate	EPA 9056A_(02/07)	7
Dissolved Organic Carbon	EPA 9060A_1_2004	7
Total Organic Carbon	EPA 9060A_1_2004	7
Methyl Mercury	EPA 1630	7
Mercury	EPA 1631 E-02	7
Arsenic (III)	EPA 1632A 1998	7
Arsenic (V)	EPA 1632A 1998	7
Mercury	EPA 7471B_(2/07)	7
1,2,3-Trichloropropane	EPA 8011-92	7
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8011-92	7
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8011-92	7
Diesel range organics (DRO)	EPA 8015B_2_1996	7
Gasoline range organics (GRO)	EPA 8015B_2_1996	7
Motor Oil	EPA 8015B_2_1996	7
2,4'-DDD	EPA 8081B_(2/07)	7
2,4'-DDE	EPA 8081B_(2/07)	7
2,4'-DDT	EPA 8081B_(2/07)	7
4,4'-DDD	EPA 8081B_(2/07)	7
4,4'-DDE	EPA 8081B_(2/07)	7
4,4'-DDT	EPA 8081B_(2/07)	7
Aldrin	EPA 8081B_(2/07)	7
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081B_(2/07)	7
alpha-Chlordane	EPA 8081B_(2/07)	7
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081B_(2/07)	7
Chlordane (tech.)	EPA 8081B_(2/07)	7
cis-Nonachlor	EPA 8081B_(2/07)	7
delta-BHC	EPA 8081B_(2/07)	7
Dieldrin	EPA 8081B_(2/07)	7
Endosulfan I	EPA 8081B_(2/07)	7
Endosulfan II	EPA 8081B_(2/07)	7
Endosulfan sulfate	EPA 8081B_(2/07)	7
Endrin	EPA 8081B_(2/07)	7
Endrin aldehyde	EPA 8081B_(2/07)	7
Endrin ketone	EPA 8081B_(2/07)	7
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081B_(2/07)	7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
gamma-Chlordane	EPA 8081B_(2/07)	7
Heptachlor	EPA 8081B_(2/07)	7
Heptachlor epoxide	EPA 8081B_(2/07)	7
Hexachlorobenzene	EPA 8081B_(2/07)	7
Hexachlorobutadiene	EPA 8081B_(2/07)	7
Methoxychlor	EPA 8081B_(2/07)	7
Mirex	EPA 8081B_(2/07)	7
Oxychlordane	EPA 8081B_(2/07)	7
Toxaphene (Chlorinated camphene)	EPA 8081B_(2/07)	7
trans-Nonachlor	EPA 8081B_(2/07)	7
Aroclor-1016 (PCB-1016)	EPA 8082A_(2/07)	4,6,7
Aroclor-1221 (PCB-1221)	EPA 8082A_(2/07)	4,6,7
Aroclor-1232 (PCB-1232)	EPA 8082A_(2/07)	4,6,7
Aroclor-1242 (PCB-1242)	EPA 8082A_(2/07)	4,6,7
Aroclor-1248 (PCB-1248)	EPA 8082A_(2/07)	4,6,7
Aroclor-1254 (PCB-1254)	EPA 8082A_(2/07)	4,6,7
Aroclor-1260 (PCB-1260)	EPA 8082A_(2/07)	4,6,7
Aroclor-1262 (PCB-1262)	EPA 8082A_(2/07)	4,6,7
Aroclor-1268 (PCB-1268)	EPA 8082A_(2/07)	4,6,7
>C10-C12 Aliphatic EPH	WDOE EPH_(1997)	2,7
>C10-C12 Aromatic EPH	WDOE EPH_(1997)	2,7,10
>C12-C16 Aliphatic EPH	WDOE EPH_(1997)	2,7
>C12-C16 Aromatic EPH	WDOE EPH_(1997)	2,7
>C16-C21 Aliphatic EPH	WDOE EPH_(1997)	2,7
>C16-C21 Aromatic EPH	WDOE EPH_(1997)	2,7
>C21-C34 Alpihatic EPH	WDOE EPH_(1997)	2,7
>C21-C34 Aromatic EPH	WDOE EPH_(1997)	2,7
C8-C10 Aliphatic EPH	WDOE EPH_(1997)	2,7
C8-C10 Aromatic EPH	WDOE EPH_(1997)	2,7
Diesel range organics (DRO)	WDOE NWTPH-Dx_(1997)	2,7
Motor Oil	WDOE NWTPH-Dx_(1997)	2,7
Gasoline range organics (GRO)	WDOE NWTPH-Gx_(1997)	2,7,9
>C10-C12 Aliphatic VPH	WDOE VPH_(1997)	2,7
>C10-C12 Aromatic VPH	WDOE VPH_(1997)	2,7
>C12-C13 Aromatic VPH	WDOE VPH_(1997)	2,7
>C6-C8 Aliphatic VPH	WDOE VPH_(1997)	2,7
Benzene	WDOE VPH_(1997)	2,7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
C5-C6 Aliphatic VPH	WDOE VPH_(1997)	2,7
C8-C10 Aliphatic VPH	WDOE VPH_(1997)	2,7
C8-C10 Aromatic VPH	WDOE VPH_(1997)	2,7
Ethylbenzene	WDOE VPH_(1997)	2,7
m+p-xylene	WDOE VPH_(1997)	2,7
Methyl tert-butyl ether (MTBE)	WDOE VPH_(1997)	2,7
o-Xylene	WDOE VPH_(1997)	2,7
Toluene	WDOE VPH_(1997)	2,7
Aluminum	EPA 6010D_(7/14)	7
Antimony	EPA 6010D_(7/14)	7
Arsenic	EPA 6010D_(7/14)	7
Barium	EPA 6010D_(7/14)	7
Beryllium	EPA 6010D_(7/14)	7
Boron	EPA 6010D_(7/14)	7
Cadmium	EPA 6010D_(7/14)	7
Calcium	EPA 6010D_(7/14)	7
Chromium	EPA 6010D_(7/14)	7
Cobalt	EPA 6010D_(7/14)	7
Copper	EPA 6010D_(7/14)	7
Iron	EPA 6010D_(7/14)	7
Lead	EPA 6010D_(7/14)	7
Magnesium	EPA 6010D_(7/14)	7
Manganese	EPA 6010D_(7/14)	7
Molybdenum	EPA 6010D_(7/14)	7
Nickel	EPA 6010D_(7/14)	7
Potassium	EPA 6010D_(7/14)	7
Selenium	EPA 6010D_(7/14)	7
Silica	EPA 6010D_(7/14)	7
Silicon	EPA 6010D_(7/14)	7
Silver	EPA 6010D_(7/14)	7
Sodium	EPA 6010D_(7/14)	7
Strontium	EPA 6010D_(7/14)	7
Thallium	EPA 6010D_(7/14)	7
Tin	EPA 6010D_(7/14)	7
Titanium	EPA 6010D_(7/14)	7
Vanadium	EPA 6010D_(7/14)	7
Zinc	EPA 6010D_(7/14)	7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Aluminum	EPA 6020B_(7/14)	7
Antimony	EPA 6020B_(7/14)	7
Arsenic	EPA 6020B_(7/14)	7
Barium	EPA 6020B_(7/14)	7
Beryllium	EPA 6020B_(7/14)	7
Cadmium	EPA 6020B_(7/14)	7
Chromium	EPA 6020B_(7/14)	7
Cobalt	EPA 6020B_(7/14)	7
Copper	EPA 6020B_(7/14)	7
Iron	EPA 6020B_(7/14)	7
Lead	EPA 6020B_(7/14)	7
Manganese	EPA 6020B_(7/14)	7
Mercury	EPA 6020B_(7/14)	7
Molybdenum	EPA 6020B_(7/14)	7
Nickel	EPA 6020B_(7/14)	7
Selenium	EPA 6020B_(7/14)	7
Silver	EPA 6020B_(7/14)	7
Thallium	EPA 6020B_(7/14)	7
Titanium	EPA 6020B_(7/14)	1,7
Uranium	EPA 6020B_(7/14)	7
Vanadium	EPA 6020B_(7/14)	7
Zinc	EPA 6020B_(7/14)	7
Mercury	EPA 7470A_1_1994	7
Mercury	EPA 7471A_1_1994	7
1,1,1,2-Tetrachloroethane	EPA 8260D_4_(6/18)	7
1,1,1-Trichloroethane	EPA 8260D_4_(6/18)	7
1,1,2,2-Tetrachloroethane	EPA 8260D_4_(6/18)	7
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA 8260D_4_(6/18)	7
1,1,2-Trichloroethane	EPA 8260D_4_(6/18)	7
1,1-Dichloroethane	EPA 8260D_4_(6/18)	7
1,1-Dichloroethylene	EPA 8260D_4_(6/18)	7
1,1-Dichloropropene	EPA 8260D_4_(6/18)	7
1,2,3-Trichlorobenzene	EPA 8260D_4_(6/18)	7
1,2,3-Trichloropropane	EPA 8260D_4_(6/18)	7
1,2,3-Trimethylbenzene	EPA 8260D_4_(6/18)	7
1,2,4-Trichlorobenzene	EPA 8260D_4_(6/18)	7
1,2,4-Trimethylbenzene	EPA 8260D_4_(6/18)	7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260D_4_(6/18)	7
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260D_4_(6/18)	7
1,2-Dichlorobenzene	EPA 8260D_4_(6/18)	7
1,2-Dichloroethane (Ethylene dichloride)	EPA 8260D_4_(6/18)	7
1,2-Dichloropropane	EPA 8260D_4_(6/18)	7
1,3,5-Trimethylbenzene	EPA 8260D_4_(6/18)	7
1,3-Dichlorobenzene	EPA 8260D_4_(6/18)	7
1,3-Dichloropropane	EPA 8260D_4_(6/18)	7
1,4-Dichlorobenzene	EPA 8260D_4_(6/18)	7
2,2-Dichloropropane	EPA 8260D_4_(6/18)	7
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260D_4_(6/18)	7
2-Chloroethyl vinyl ether	EPA 8260D_4_(6/18)	7
2-Chlorotoluene	EPA 8260D_4_(6/18)	7
2-Hexanone	EPA 8260D_4_(6/18)	7
4-Chlorotoluene	EPA 8260D_4_(6/18)	7
4-Isopropyltoluene (p-Cymene)	EPA 8260D_4_(6/18)	7
4-Methyl-2-pentanone (MIBK)	EPA 8260D_4_(6/18)	7
Acetone	EPA 8260D_4_(6/18)	7
Acetonitrile	EPA 8260D_4_(6/18)	7
Acrolein (Propenal)	EPA 8260D_4_(6/18)	7
Acrylonitrile	EPA 8260D_4_(6/18)	7
Benzene	EPA 8260D_4_(6/18)	7
Bromobenzene	EPA 8260D_4_(6/18)	7
Bromochloromethane	EPA 8260D_4_(6/18)	7
Bromodichloromethane	EPA 8260D_4_(6/18)	7
Bromoform	EPA 8260D_4_(6/18)	7
Carbon disulfide	EPA 8260D_4_(6/18)	7
Carbon tetrachloride	EPA 8260D_4_(6/18)	7
Chlorobenzene	EPA 8260D_4_(6/18)	7
Chlorodibromomethane	EPA 8260D_4_(6/18)	7
Chloroethane (Ethyl chloride)	EPA 8260D_4_(6/18)	7
Chloroform	EPA 8260D_4_(6/18)	7
cis-1,2-Dichloroethylene	EPA 8260D_4_(6/18)	7
cis-1,3-Dichloropropene	EPA 8260D_4_(6/18)	7
Dibromomethane	EPA 8260D_4_(6/18)	7
Dichlorodifluoromethane (Freon-12)	EPA 8260D_4_(6/18)	7
Di-isopropylether (DIPE)	EPA 8260D_4_(6/18)	7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Ethylbenzene	EPA 8260D_4_(6/18)	7
Ethyl-t-butylether (ETBE)	EPA 8260D_4_(6/18)	7
Hexachlorobutadiene	EPA 8260D_4_(6/18)	7
Iodomethane (Methyl iodide)	EPA 8260D_4_(6/18)	7
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260D_4_(6/18)	7
Isopropylbenzene	EPA 8260D_4_(6/18)	7
m+p-xylene	EPA 8260D_4_(6/18)	7
Methacrylonitrile	EPA 8260D_4_(6/18)	7
Methyl acetate	EPA 8260D_4_(6/18)	7
Methyl bromide (Bromomethane)	EPA 8260D_4_(6/18)	7
Methyl chloride (Chloromethane)	EPA 8260D_4_(6/18)	7
Methyl tert-butyl ether (MTBE)	EPA 8260D_4_(6/18)	7
Methylcyclohexane	EPA 8260D_4_(6/18)	7
Methylene chloride (Dichloromethane)	EPA 8260D_4_(6/18)	7
Naphthalene	EPA 8260D_4_(6/18)	7
n-Butyl alcohol (1-Butanol, n-Butanol)	EPA 8260D_4_(6/18)	7
n-Butylbenzene	EPA 8260D_4_(6/18)	7
n-Hexane	EPA 8260D_4_(6/18)	7
n-Propylbenzene	EPA 8260D_4_(6/18)	7
o-Xylene	EPA 8260D_4_(6/18)	7
sec-Butylbenzene	EPA 8260D_4_(6/18)	7
Styrene	EPA 8260D_4_(6/18)	7
tert-amylmethylether (TAME)	EPA 8260D_4_(6/18)	7
tert-Butyl alcohol	EPA 8260D_4_(6/18)	7
tert-Butylbenzene	EPA 8260D_4_(6/18)	7
Tetrachloroethylene (Perchloroethylene)	EPA 8260D_4_(6/18)	7
Tetrahydrofuran (THF)	EPA 8260D_4_(6/18)	7
Toluene	EPA 8260D_4_(6/18)	7
trans-1,2-Dichloroethylene	EPA 8260D_4_(6/18)	7
trans-1,3-Dichloropropylene	EPA 8260D_4_(6/18)	7
trans-1,4-Dichloro-2-butene	EPA 8260D_4_(6/18)	7
Trichlorofluoromethane (Freon 11)	EPA 8260D_4_(6/18)	7
Vinyl acetate	EPA 8260D_4_(6/18)	7
Vinyl chloride	EPA 8260D_4_(6/18)	7
Xylene (total)	EPA 8260D_4_(6/18)	7
1,2,4-Trichlorobenzene	EPA 8270E_6_(6/18)	5,7
1,2-Dichlorobenzene	EPA 8270E_6_(6/18)	5,7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
1,3-Dichlorobenzene	EPA 8270E_6_(6/18)	5,7
1,4-Dichlorobenzene	EPA 8270E_6_(6/18)	5,7
1-Methylnaphthalene	EPA 8270E_6_(6/18)	5,7
2,2'-Oxybis(1-chloropropane)	EPA 8270E_6_(6/18)	5,7
2,3,4,6-Tetrachlorophenol	EPA 8270E_6_(6/18)	5,7
2,4,5-Trichlorophenol	EPA 8270E_6_(6/18)	5,7
2,4,6-Trichlorophenol	EPA 8270E_6_(6/18)	5,7
2,4-Dichlorophenol	EPA 8270E_6_(6/18)	5,7
2,4-Dimethylphenol	EPA 8270E_6_(6/18)	5,7
2,4-Dinitrophenol	EPA 8270E_6_(6/18)	5,7
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270E_6_(6/18)	5,7
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270E_6_(6/18)	5,7
2-Chloronaphthalene	EPA 8270E_6_(6/18)	5,7
2-Chlorophenol	EPA 8270E_6_(6/18)	5,7
2-Methylnaphthalene	EPA 8270E_6_(6/18)	5,7
2-Methylphenol (o-Cresol)	EPA 8270E_6_(6/18)	5,7
2-Nitroaniline	EPA 8270E_6_(6/18)	5,7
2-Nitrophenol	EPA 8270E_6_(6/18)	5,7
3,3'-Dichlorobenzidine	EPA 8270E_6_(6/18)	5,7
3-Nitroaniline	EPA 8270E_6_(6/18)	5,7
4,6-Dinitro-2-methylphenol	EPA 8270E_6_(6/18)	5,7
4-Bromophenyl phenyl ether (BDE-3)	EPA 8270E_6_(6/18)	5,7
4-Chloro-3-methylphenol	EPA 8270E_6_(6/18)	5,7
4-Chloroaniline	EPA 8270E_6_(6/18)	5,7
4-Chlorophenyl phenylether	EPA 8270E_6_(6/18)	5,7
4-Nitroaniline	EPA 8270E_6_(6/18)	5,7
4-Nitrophenol	EPA 8270E_6_(6/18)	5,7
Acenaphthene	EPA 8270E_6_(6/18)	5,7
Acenaphthylene	EPA 8270E_6_(6/18)	5,7
Acetophenone	EPA 8270E_6_(6/18)	5,7
Aniline	EPA 8270E_6_(6/18)	5,7
Anthracene	EPA 8270E_6_(6/18)	5,7
Benzo(a)anthracene	EPA 8270E_6_(6/18)	5,7
Benzo(a)pyrene	EPA 8270E_6_(6/18)	5,7
Benzo(g,h,i)perylene	EPA 8270E_6_(6/18)	5,7
Benzo(k)fluoranthene	EPA 8270E_6_(6/18)	5,7
Benzo[b]fluoranthene	EPA 8270E_6_(6/18)	5,7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Benzoic acid	EPA 8270E_6_(6/18)	5,7
Benzyl alcohol	EPA 8270E_6_(6/18)	5,7
bis(2-Chloroethoxy)methane	EPA 8270E_6_(6/18)	5,7
bis(2-Chloroethyl) ether	EPA 8270E_6_(6/18)	5,7
Butyl benzyl phthalate	EPA 8270E_6_(6/18)	5,7
Carbazole	EPA 8270E_6_(6/18)	5,7
Chrysene	EPA 8270E_6_(6/18)	5,7
Di(2-ethylhexyl)phthalate	EPA 8270E_6_(6/18)	5,7
Dibenz(a,h) anthracene	EPA 8270E_6_(6/18)	5,7
Dibenzofuran	EPA 8270E_6_(6/18)	5,7
Diethyl phthalate	EPA 8270E_6_(6/18)	5,7
Dimethyl phthalate	EPA 8270E_6_(6/18)	5,7
Di-n-butyl phthalate	EPA 8270E_6_(6/18)	5,7
Di-n-octyl phthalate	EPA 8270E_6_(6/18)	5,7
Fluoranthene	EPA 8270E_6_(6/18)	5,7
Fluorene	EPA 8270E_6_(6/18)	5,7
Hexachlorobenzene	EPA 8270E_6_(6/18)	5,7
Hexachlorobutadiene	EPA 8270E_6_(6/18)	5,7
Hexachlorocyclopentadiene	EPA 8270E_6_(6/18)	5,7
Hexachloroethane	EPA 8270E_6_(6/18)	5,7
Indeno(1,2,3-cd) pyrene	EPA 8270E_6_(6/18)	5,7
Isophorone	EPA 8270E_6_(6/18)	5,7
m+p Cresol	EPA 8270E_6_(6/18)	5,7
Naphthalene	EPA 8270E_6_(6/18)	5,7
n-Decane	EPA 8270E_6_(6/18)	5,7
Nitrobenzene	EPA 8270E_6_(6/18)	5,7
N-Nitrosodimethylamine	EPA 8270E_6_(6/18)	5,7
N-Nitroso-di-n-propylamine	EPA 8270E_6_(6/18)	5,7
N-Nitrosodiphenylamine	EPA 8270E_6_(6/18)	5,7
n-Octadecane	EPA 8270E_6_(6/18)	5,7
Pentachlorophenol	EPA 8270E_6_(6/18)	5,7
Phenanthrene	EPA 8270E_6_(6/18)	5,7
Phenol	EPA 8270E_6_(6/18)	5,7
Pyrene	EPA 8270E_6_(6/18)	5,7
Pyridine	EPA 8270E_6_(6/18)	5,7
1,4-Dioxane (1,4- Diethyleneoxide)	EPA 8270E_6_(6/18) SIM	7
1-Methylnaphthalene	EPA 8270E_6_(6/18) SIM	7

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2-Methylnaphthalene	EPA 8270E_6_(6/18) SIM	7
Acenaphthene	EPA 8270E_6_(6/18) SIM	7
Acenaphthylene	EPA 8270E_6_(6/18) SIM	7
Anthracene	EPA 8270E_6_(6/18) SIM	7
Benzo(a)anthracene	EPA 8270E_6_(6/18) SIM	7
Benzo(a)pyrene	EPA 8270E_6_(6/18) SIM	7
Benzo(g,h,i)perylene	EPA 8270E_6_(6/18) SIM	7
Benzo(k)fluoranthene	EPA 8270E_6_(6/18) SIM	7
Benzo[b]fluoranthene	EPA 8270E_6_(6/18) SIM	7
bis(2-Chloroethyl) ether	EPA 8270E_6_(6/18) SIM	7,10
Chrysene	EPA 8270E_6_(6/18) SIM	7
Di(2-ethylhexyl)phthalate	EPA 8270E_6_(6/18) SIM	7
Dibenz(a,h) anthracene	EPA 8270E_6_(6/18) SIM	7
Fluoranthene	EPA 8270E_6_(6/18) SIM	7
Fluorene	EPA 8270E_6_(6/18) SIM	7
Indeno(1,2,3-cd) pyrene	EPA 8270E_6_(6/18) SIM	7
Naphthalene	EPA 8270E_6_(6/18) SIM	7
Pentachlorophenol	EPA 8270E_6_(6/18) SIM	7
Phenanthrene	EPA 8270E_6_(6/18) SIM	7
Pyrene	EPA 8270E_6_(6/18) SIM	7
Dibutyltin	Krone 1988	3
Monobutyltin	Krone 1988	3
Tetrabutyltin	Krone 1988	3
Tributyltin	Krone 1988	3
Gasoline range organics (GRO)	NWTPH-Gx (GC/MS)	2,7
Particle Size Distribution	ASTM D422-63 (07)	7
Ignitability	EPA 1020A_1_1992	7
Corrosivity	EPA 9045C_3_1995	7
Particle Size Distribution	PLUMB 1981	7
Particle Size Distribution	PSEP 1986 Wet Sieve	

Accredited Parameter Note Detail

(1) Liquid matrix only. (2) Washington Department of Ecology Analytical Methods for Petroleum Hydrocarbons, Publication Number ECY 97-602, June 1997. (3) Procedure is an Ion Trap method for determination of tetra-, tri-, di-, and monobutyltin in sediments and pore water. (4) Includes oil matrix. (5) For sediments, modifications are: Extraction of 20 grams of sample with an initial solvent volume of 35-50 mL instead of extraction of 30 grams of sample with an initial solvent volume of 60 mL. (6) When acid cleanup is not necessary, lab runs according to EPA 8082A protocol. (7) Accreditation based in part on recognition of Oregon NELAP accreditation. (9) Includes determination by GCMS.(10) Provisional accreditation pending submittal of acceptable Proficiency Testing (PT) results (WAC 173-50-110).

07/27/2022

Authentication Signature
Rebecca Wood, Lab Accreditation Unit Supervisor

Date

ANSI National Accreditation Board

CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Fulfills the requirements of

ISO/IEC 17025:2017

and

U.S. Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories (DoD QSM V5.4)

In the field of

TESTING

This certificate is valid only when accompanied by a current scope of accreditation document. The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 20 January 2024
Certificate Number: L2468

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

AND

U.S. Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories (DoD QSM V5.4)

Eurofins Sacramento

880 Riverside Parkway
West Sacramento, CA 95605
Ms. Lisa Stafford
916-373-5600

TESTING

Valid to: **January 20, 2024** Certificate Number: **L2468**

Environmental

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C	Aluminum
ICP-AES	EPA 6010B/6010C	Antimony
ICP-AES	EPA 6010B/6010C	Arsenic
ICP-AES	EPA 6010B/6010C	Barium
ICP-AES	EPA 6010B/6010C	Beryllium
ICP-AES	EPA 6010B/6010C	Boron
ICP-AES	EPA 6010B/6010C	Cadmium
ICP-AES	EPA 6010B/6010C	Calcium
ICP-AES	EPA 6010B/6010C	Chromium (Total)
ICP-AES	EPA 6010B/6010C	Cobalt
ICP-AES	EPA 6010B/6010C	Copper
ICP-AES	EPA 6010B/6010C	Iron
ICP-AES	EPA 6010B/6010C	Lead
ICP-AES	EPA 6010B/6010C	Magnesium
ICP-AES	EPA 6010B/6010C	Manganese
ICP-AES	EPA 6010B/6010C	Molybdenum

Non-Potable Water

Technology	Method	Analyte
ICP-AES	EPA 6010B/6010C	Nickel
ICP-AES	EPA 6010B/6010C	Potassium
ICP-AES	EPA 6010B/6010C	Selenium
ICP-AES	EPA 6010B/6010C	Silica
ICP-AES	EPA 6010B/6010C	Silicon
ICP-AES	EPA 6010B/6010C	Silver
ICP-AES	EPA 6010B/6010C	Sodium
ICP-AES	EPA 6010B/6010C	Thallium
ICP-AES	EPA 6010B/6010C	Tin
ICP-AES	EPA 6010B/6010C	Titanium
ICP-AES	EPA 6010B/6010C	Vanadium
ICP-AES	EPA 6010B/6010C	Zinc
ICP-MS	EPA 6020/6020A	Aluminum
ICP-MS	EPA 6020/6020A	Antimony
ICP-MS	EPA 6020/6020A	Arsenic
ICP-MS	EPA 6020/6020A	Barium
ICP-MS	EPA 6020/6020A	Beryllium
ICP-MS	EPA 6020/6020A	Cadmium
ICP-MS	EPA 6020/6020A	Calcium
ICP-MS	EPA 6020/6020A	Chromium (Total)
ICP-MS	EPA 6020/6020A	Cobalt
ICP-MS	EPA 6020/6020A	Copper
ICP-MS	EPA 6020/6020A	Iron
ICP-MS	EPA 6020/6020A	Lead
ICP-MS	EPA 6020/6020A	Magnesium
ICP-MS	EPA 6020/6020A	Manganese
ICP-MS	EPA 6020/6020A	Molybdenum
ICP-MS	EPA 6020/6020A	Nickel
ICP-MS	EPA 6020/6020A	Phosphorus
ICP-MS	EPA 6020/6020A	Potassium
ICP-MS	EPA 6020/6020A	Selenium
ICP-MS	EPA 6020/6020A	Silver
ICP-MS	EPA 6020/6020A	Sodium
ICP-MS	EPA 6020/6020A	Strontium
ICP-MS	EPA 6020/6020A	Thallium

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-MS	EPA 6020/6020A	Tin
ICP-MS	EPA 6020/6020A	Titanium
ICP-MS	EPA 6020/6020A	Uranium
ICP-MS	EPA 6020/6020A	Vanadium
ICP-MS	EPA 6020/6020A	Zinc
CVAAS	EPA 7470A	Mercury
Colorimetric	EPA 353.2	Nitrate
Colorimetric	EPA 353.2	Nitrate-nitrite
Colorimetric	EPA 353.2	Nitrite
Colorimetric	EPA 410.4	Chemical Oxygen Demand (COD)
LC/MS/MS	EPA 6850	Perchlorate
Colorimetric	EPA 7196A	Chromium (Hexavalent)
Probe	EPA 9040B/9040C	pH
Ion Chromatography	EPA 9056A/300.0	Bromide
Ion Chromatography	EPA 9056A/300.0	Chloride
Ion Chromatography	EPA 9056A/300.0	Fluoride
Ion Chromatography	EPA 9056A/300.0	Nitrate
Ion Chromatography	EPA 9056A/300.0	Nitrite
Ion Chromatography	EPA 9056A/300.0	Orthophosphate
Ion Chromatography	EPA 9056A/300.0	Sulfate
Titration	SM 2320B	Alkalinity
Gravimetric	SM 2540B	Solids, Total
Gravimetric	SM 2540C	Solids, Total Dissolved
Gravimetric	SM 2540D	Solids, Total Suspended
Colorimetric/Hydrolysis	EPA 353.2 Modified WS-WC-0050	Nitrocellulose
GC/MS	EPA 8260B/8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethene
GC/MS	EPA 8260B/8260C	1,1-Dichloropropene
GC/MS	EPA 8260B/8260C	1,2,3-Trichlorobenzene

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260B/8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/8260C	1,2-Dibromoethane
GC/MS	EPA 8260B/8260C	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,2-Dichloroethane
GC/MS	EPA 8260B/8260C	1,2-Dichloropropane
GC/MS	EPA 8260B/8260C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,3-Dichloropropane
GC/MS	EPA 8260B/8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1-Chlorohexane
GC/MS	EPA 8260B/8260C	2,2-Dichloropropane
GC/MS	EPA 8260B/8260C	2-Butanone (MEK)
GC/MS	EPA 8260B/8260C	2-Chlorotoluene
GC/MS	EPA 8260B/8260C	2-Hexanone (MBK)
GC/MS	EPA 8260B/8260C	2-Methyl-2-propanol (tert- Butyl Alcohol, TBA)
GC/MS	EPA 8260B/8260C	4-Chlorotoluene
GC/MS	EPA 8260B/8260C	4-Isopropyltoluene
GC/MS	EPA 8260B/8260C	4-Methyl-2-pentanone (MIBK)
GC/MS	EPA 8260B/8260C	Acetone
GC/MS	EPA 8260B/8260C	Allyl Chloride
GC/MS	EPA 8260B/8260C	Benzene
GC/MS	EPA 8260B/8260C	Bromobenzene
GC/MS	EPA 8260B/8260C	Bromochloromethane
GC/MS	EPA 8260B/8260C	Bromodichloromethane
GC/MS	EPA 8260B/8260C	Bromoform
GC/MS	EPA 8260B/8260C	Bromomethane
GC/MS	EPA 8260B/8260C	Carbon Disulfide
GC/MS	EPA 8260B/8260C	Carbon Tetrachloride
GC/MS	EPA 8260B/8260C	Chlorobenzene
GC/MS	EPA 8260B/8260C	Chloroethane
GC/MS	EPA 8260B/8260C	Chloroform
GC/MS	EPA 8260B/8260C	Chloromethane

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260B/8260C	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Cyclohexane
GC/MS	EPA 8260B/8260C	Dibromochloromethane
GC/MS	EPA 8260B/8260C	Dibromomethane
GC/MS	EPA 8260B/8260C	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260C	Diisopropyl Ether (DIPE)
GC/MS	EPA 8260B/8260C	Ethylbenzene
GC/MS	EPA 8260B/8260C	Ethylmethacrylate
GC/MS	EPA 8260B/8260C	Ethyl tert-butyl Ether (ETBE)
GC/MS	EPA 8260B/8260C	Hexachlorobutadiene
GC/MS	EPA 8260B/8260C	Hexane
GC/MS	EPA 8260B/8260C	Iodomethane
GC/MS	EPA 8260B/8260C	Isobutanol (2-Methyl-1-propanol)
GC/MS	EPA 8260B/8260C	Isopropylbenzene
GC/MS	EPA 8260B/8260C	m & p Xylene
GC/MS	EPA 8260B/8260C	Methyl tert-butyl Ether (MTBE)
GC/MS	EPA 8260B/8260C	Methylene Chloride
GC/MS	EPA 8260B/8260C	Naphthalene
GC/MS	EPA 8260B/8260C	n-Butylbenzene
GC/MS	EPA 8260B/8260C	n-Propylbenzene
GC/MS	EPA 8260B/8260C	o-Xylene
GC/MS	EPA 8260B/8260C	sec-Butylbenzene
GC/MS	EPA 8260B/8260C	Styrene
GC/MS	EPA 8260B/8260C	t-Amyl methyl Ether (TAME)
GC/MS	EPA 8260B/8260C	t-1,4-Dichloro-2-Butene
GC/MS	EPA 8260B/8260C	tert-Butylbenzene
GC/MS	EPA 8260B/8260C	Tetrachloroethene
GC/MS	EPA 8260B/8260C	Toluene
GC/MS	EPA 8260B/8260C	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C	trans-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Trichloroethene
GC/MS	EPA 8260B/8260C	Trichlorofluoromethane
GC/MS	EPA 8260B/8260C	Vinyl Acetate
GC/MS	EPA 8260B/8260C	Vinyl Chloride

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	Xylenes, Total
GC/MS	EPA 8260B/AK101MS	Gasoline (GRO)
GC/MS	EPA 8270C/8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/8270D	1,2-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1,2-Diphenylhydrazine (as Azobenzene)
GC/MS	EPA 8270C/8270D	1,3-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1,3-Dinitrobenzene
GC/MS	EPA 8270C/8270D	1,4-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1-Methylnaphthalene
GC/MS	EPA 8270C/8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/8270D	2,4-Dichlorophenol
GC/MS	EPA 8270C/8270D	2,4-Dimethylphenol
GC/MS	EPA 8270C/8270D	2,4-Dinitrophenol
GC/MS	EPA 8270C/8270D	2,4-Dinitrotoluene
GC/MS	EPA 8270C/8270D	2,6-Dichlorophenol
GC/MS	EPA 8270C/8270D	2,6-Dinitrotoluene
GC/MS	EPA 8270C/8270D	2-Chloronaphthalene
GC/MS	EPA 8270C/8270D	2-Chlorophenol
GC/MS	EPA 8270C/8270D	2-Methylnaphthalene
GC/MS	EPA 8270C/8270D	2-Methylphenol
GC/MS	EPA 8270C/8270D	2-Nitroaniline
GC/MS	EPA 8270C/8270D	2-Nitrophenol
GC/MS	EPA 8270C/8270D	3&4-Methylphenol
GC/MS	EPA 8270C/8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/8270D	3-Nitroaniline
GC/MS	EPA 8270C/8270D	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/8270D	4-Chloroaniline
GC/MS	EPA 8270C/8270D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/8270D	4-Nitroaniline
GC/MS	EPA 8270C/8270D	4-Nitrophenol

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270D	Acenaphthene
GC/MS	EPA 8270C/8270D	Acenaphthylene
GC/MS	EPA 8270C/8270D	Aniline
GC/MS	EPA 8270C/8270D	Anthracene
GC/MS	EPA 8270C/8270D	Benzo(a)anthracene
GC/MS	EPA 8270C/8270D	Benzo(a)pyrene
GC/MS	EPA 8270C/8270D	Benzo(b)fluoranthene
GC/MS	EPA 8270C/8270D	Benzo(g,h,i)perylene
GC/MS	EPA 8270C/8270D	Benzo(k)fluoranthene
GC/MS	EPA 8270C/8270D	Benzoic Acid
GC/MS	EPA 8270C/8270D	Benzyl Alcohol
GC/MS	EPA 8270C/8270D	Benzyl butyl Phthalate
GC/MS	EPA 8270C/8270D	Biphenyl
GC/MS	EPA 8270C/8270D	Bis(2-chloroethoxy) Methane
GC/MS	EPA 8270C/8270D	Bis(2-chloroethyl) Ether
GC/MS	EPA 8270C/8270D	Bis(2-chloroisopropyl) Ether
GC/MS	EPA 8270C/8270D	Carbazole
GC/MS	EPA 8270C/8270D	Chrysene
GC/MS	EPA 8270C/8270D	Bis (2-ethylhexyl) Phthalate
GC/MS	EPA 8270C/8270D	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/8270D	Dibenzofuran
GC/MS	EPA 8270C/8270D	Diethyl Phthalate
GC/MS	EPA 8270C/8270D	Dimethyl Phthalate
GC/MS	EPA 8270C/8270D	Di-n-butyl Phthalate
GC/MS	EPA 8270C/8270D	Di-n-octyl Phthalate
GC/MS	EPA 8270C/8270D	Fluoranthene
GC/MS	EPA 8270C/8270D	Fluorene
GC/MS	EPA 8270C/8270D	Hexachlorobenzene
GC/MS	EPA 8270C/8270D	Hexachlorobutadiene
GC/MS	EPA 8270C/8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/8270D	Hexachloroethane
GC/MS	EPA 8270C/8270D	Indeno(1,2,3-c,d) Pyrene
GC/MS	EPA 8270C/8270D	Isophorone
GC/MS	EPA 8270C/8270D	Naphthalene
GC/MS	EPA 8270C/8270D	Nitrobenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270D	n-Nitrosodimethylamine
GC/MS	EPA 8270C/8270D	n-Nitrosodi-n-propylamine
GC/MS	EPA 8270C/8270D	n-Nitrosodiphenylamine
GC/MS	EPA 8270C/8270D	Pentachlorophenol
GC/MS	EPA 8270C/8270D	Phenanthrene
GC/MS	EPA 8270C/8270D	Phenol
GC/MS	EPA 8270C/8270D	Pyrene
GC/MS	EPA 8270C/8270D	Pyridine
GC/MS SIM	EPA 8260C-SIM	1,1,2-Trichloroethane
GC/MS SIM	EPA 8260C-SIM	1,1,2,2-Tetrachloroethane
GC/MS SIM	EPA 8260C-SIM	1,2,3-Trichloropropane
GC/MS SIM	EPA 8260C-SIM	1,2-Dibromoethane
GC/MS SIM	EPA 8260C-SIM	1,2-Dichloroethane
GC/MS SIM	EPA 8260C-SIM	1,3-Butadiene
GC/MS SIM	EPA 8260C-SIM	1,4-Dichlorobenzene
GC/MS SIM	EPA 8260C-SIM	Benzene
GC/MS SIM	EPA 8260C-SIM	Bromodichloromethane
GC/MS SIM	EPA 8260C-SIM	Bromoform
GC/MS SIM	EPA 8260C-SIM	Bromomethane
GC/MS SIM	EPA 8260C-SIM	Chloroform
GC/MS SIM	EPA 8260C-SIM	Dibromochloromethane
GC/MS SIM	EPA 8260C-SIM	Hexachlorobutadiene
GC/MS SIM	EPA 8260C-SIM	Naphthalene
GC/MS SIM	EPA 8260C-SIM	Tetrachloroethene
GC/MS SIM	EPA 8260C-SIM	Trichloroethene
GC/MS SIM	EPA 8260C-SIM	Vinyl Chloride
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	1-Methylnaphthalene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	2-Methylnaphthalene
GC/MS SIM	EPA 8270D-SIM	3,3'-Dichlorobenzidine
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Acenaphthene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Acenaphthylene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Anthracene

Non-Potable Water

Technology	Method	Analyte
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(a)anthracene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(a)pyrene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(b)fluoranthene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(g,h,i)perylene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(k)fluoranthene
GC/MS SIM	EPA 8270D-SIM	Bis(2-chloroethyl) Ether
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Chrysene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Dibenz(a,h)anthracene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Fluoranthene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Fluorene
GC/MS SIM	EPA 8270D-SIM	Hexachlorobenzene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Indeno(1,2,3-c,d) Pyrene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Naphthalene
GC/MS SIM	EPA 8270D-SIM	n-Nitrosodimethylamine
GC/MS SIM	EPA 8270D-SIM	n-Nitrosodi-n-propylamine
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Phenanthrene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Pyrene
GC/MS SIM	EPA 8270C-SIM Modified WS-MS-0011	1,4-Dioxane
GC-IT/MS	EPA 521 Modified WS-MS-0012	N-Nitrosodimethyl amine (NDMA)
GC-FID	EPA 8015B/8015C/8015D AK102	Diesel Range Organics (DRO)
GC-FID	AK103	Residual Range Organics
GC-FID	EPA 8015B/8015C/8015D	Motor Oil Range Organics (MRO)
GC-ECD	EPA 8081A/8081B	Aldrin

Non-Potable Water

Technology	Method	Analyte
GC-ECD	EPA 8081A/8081B	a-BHC
GC-ECD	EPA 8081A/8081B	b-BHC
GC-ECD	EPA 8081A/8081B	d-BHC
GC-ECD	EPA 8081A/8081B	g-BHC (Lindane)
GC-ECD	EPA 8081A/8081B	a-Chlordane
GC-ECD	EPA 8081A/8081B	g-Chlordane
GC-ECD	EPA 8081A/8081B	4,4'-DDD
GC-ECD	EPA 8081A/8081B	4,4'-DDE
GC-ECD	EPA 8081A/8081B	4,4'-DDT
GC-ECD	EPA 8081A/8081B	Dieldrin
GC-ECD	EPA 8081A/8081B	Endosulfan I
GC-ECD	EPA 8081A/8081B	Endosulfan II
GC-ECD	EPA 8081A/8081B	Endosulfan sulfate
GC-ECD	EPA 8081A/8081B	Endrin
GC-ECD	EPA 8081A/8081B	Endrin Aldehyde
GC-ECD	EPA 8081A/8081B	Endrin Ketone
GC-ECD	EPA 8081A/8081B	Heptachlor
GC-ECD	EPA 8081A/8081B	Heptachlor Epoxide
GC-ECD	EPA 8081A/8081B	Methoxychlor
GC-ECD	EPA 8081A/8081B	Toxaphene
GC-ECD	EPA 8081A/8081B	Chlordane (technical)
GC-ECD	EPA 8082/8082A	PCB-1016
GC-ECD	EPA 8082/8082A	PCB-1221
GC-ECD	EPA 8082/8082A	PCB-1232
GC-ECD	EPA 8082/8082A	PCB-1242
GC-ECD	EPA 8082/8082A	PCB-1248
GC-ECD	EPA 8082/8082A	PCB-1254
GC-ECD	EPA 8082/8082A	PCB-1260
GC-ECD	EPA 8082/8082A	PCB-1262
GC-ECD	EPA 8082/8082A	PCB-1268
GC/MS	EPA 8280A/8280B	2,3,7,8-TeCDD
GC/MS	EPA 8280A/8280B	1,2,3,7,8-PeCDD
GC/MS	EPA 8280A/8280B	1,2,3,4,7,8-HxCDD
GC/MS	EPA 8280A/8280B	1,2,3,6,7,8-HxCDD
GC/MS	EPA 8280A/8280B	1,2,3,7,8,9-HxCDD

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8280A/8280B	1,2,3,4,6,7,8-HpCDD
GC/MS	EPA 8280A/8280B	OCDD
GC/MS	EPA 8280A/8280B	2,3,7,8-TeCDF
GC/MS	EPA 8280A/8280B	1,2,3,7,8-PeCDF
GC/MS	EPA 8280A/8280B	2,3,4,7,8-PeCDF
GC/MS	EPA 8280A/8280B	1,2,3,4,7,8-HxCDF
GC/MS	EPA 8280A/8280B	1,2,3,6,7,8-HxCDF
GC/MS	EPA 8280A/8280B	1,2,3,7,8,9-HxCDF
GC/MS	EPA 8280A/8280B	2,3,4,6,7,8-HxCDF
GC/MS	EPA 8280A/8280B	1,2,3,4,6,7,8-HpCDF
GC/MS	EPA 8280A/8280B	1,2,3,4,7,8,9-HpCDF
GC/MS	EPA 8280A/8280B	OCDF
GC/MS	EPA 8280A/8280B	Total TCDD
GC/MS	EPA 8280A/8280B	Total PeCDD
GC/MS	EPA 8280A/8280B	Total HxCDD
GC/MS	EPA 8280A/8280B	Total HeptaCDD
GC/MS	EPA 8280A/8280B	Total TCDF
GC/MS	EPA 8280A/8280B	Total PeCDF
GC/MS	EPA 8280A/8280B	Total HxCDF
GC/MS	EPA 8280A/8280B	Total HpCDF
GC/HRMS	EPA 8290/8290A/1613B	2,3,7,8-TeCDD
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,7,8-PeCDD
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,4,7,8-HxCDD
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,6,7,8-HxCDD
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,7,8,9-HxCDD
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,4,6,7,8-HpCDD
GC/HRMS	EPA 8290/8290A/1613B	OCDD
GC/HRMS	EPA 8290/8290A/1613B	2,3,7,8-TeCDF
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,7,8-PeCDF
GC/HRMS	EPA 8290/8290A/1613B	2,3,4,7,8-PeCDF
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,4,7,8-HxCDF
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,6,7,8-HxCDF
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,7,8,9-HxCDF
GC/HRMS	EPA 8290/8290A/1613B	2,3,4,6,7,8-HxCDF
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,4,6,7,8-HpCDF

Non-Potable Water

Technology	Method	Analyte
GC/HRMS	EPA 8290/8290A/1613B	1,2,3,4,7,8,9-HpCDF
GC/HRMS	EPA 8290/8290A/1613B	OCDF
GC/HRMS	EPA 8290/8290A/1613B	Total TCDD
GC/HRMS	EPA 8290/8290A/1613B	Total PeCDD
GC/HRMS	EPA 8290/8290A/1613B	Total HxCDD
GC/HRMS	EPA 8290/8290A/1613B	Total HpCDD
GC/HRMS	EPA 8290/8290A/1613B	Total TCDF
GC/HRMS	EPA 8290/8290A/1613B	Total PeCDF
GC/HRMS	EPA 8290/8290A/1613B	Total HxCDF
GC/HRMS	EPA 8290/8290A/1613B	Total HpCDF
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methyl perfluorooctanesulfon amidoacetic acid (MeFOSAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctanoic acid (PFOA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorobutyric acid (PFBA)

Non-Potable Water		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropentanoic acid (PFPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorononanoic acid (PFNA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorodecanoic acid (PFDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroundecanoic acid (PFUDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorobutane Sulfonic Acid (PFBS)

Non-Potable Water		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorodecane Sulfonic Acid (PFDS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctane Sulfonamide (FOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	10:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorododecane sulfonic acid) (10:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexadecanoic acid (PFHxDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropentane Sulfonic acid (PFPS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorononane Sulfonic acid (PFNS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)

Non-Potable Water

Technology	Method	Analyte
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-propoxypropionic acid (GenX Parent Acid) (HFPO-DA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorododecanesulfonic acid (PFDoS
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctadecanoic acid (PFODA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-4-ethylcyclohexanesulfonic acid (PFecHS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-1-propanesulfonic acid (PFPrS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethylperfluorooctane sulfonamide (EtFOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methylperfluorooctane sulfonamide (MeFOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)

Non-Potable Water		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2-Perfluorohexylethanoic acid (6:2 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2-Perfluorooctylethanoic acid (8:2 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2-Perfluorodecylethanoic acid (10:2 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropropionic acid (PPF Acid, PFPrA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3-methoxypropanoic acid (PFMPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-4-methoxybutanoic acid (PFMBA)

Non-Potable Water		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Difluoro(perfluoromethoxy)acetic acid (PFMOAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-4-isopropoxybutanoic acid (PFECA G, PFPE-1)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5,7,9-butaoxadecanoic acid (PFO4DA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5,7-trioxaoctanoic acid (PFO3OA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5-dioxahexanoic acid (PFO2HXA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-{[perfluoro-3-(perfluoroethoxy)-2-propanyl]oxy}ethanesulfonic acid (Hydro-PS Acid)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DoA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)

Non-Potable Water		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2,3,3,3-Tetrafluoro-2-(pentafluoroethoxy)propanoic acid (PEPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4-(2-carboxy-1,1,2,2-tetrafluoroethoxy)-2,2,3,3,4,5,5,5-octafluoro-pentanoic acid (R-EVE)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	1,1,2,2-Tetrafluoro-2-(1,2,2,2-tetrafluoroethoxy)ethane-1-sulfonic acid (NVHOS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2,2,3,3-Tetrafluoro-3-{[1,1,1,2,3,3-hexafluoro-3-(1,2,2,2-tetrafluoroethoxy)propan-2-yl]oxy}propanoic acid (Hydro-EVE Acid)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid (R-PSDCA)
LC/MS/MS	Draft EPA Method 1633	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	Draft EPA Method 1633	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	Draft EPA Method 1633	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	Draft EPA Method 1633	N-Methyl perfluorooctanesulfon amidoacetic acid (MeFOSAA)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctanoic acid (PFOA)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	Draft EPA Method 1633	Perfluorobutyric acid (PFBA)
LC/MS/MS	Draft EPA Method 1633	Perfluoropentanoic acid (PFPA)
LC/MS/MS	Draft EPA Method 1633	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	Draft EPA Method 1633	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	Draft EPA Method 1633	Perfluorononanoic acid (PFNA)
LC/MS/MS	Draft EPA Method 1633	Perfluorodecanoic acid (PFDA)
LC/MS/MS	Draft EPA Method 1633	Perfluoroundecanoic acid (PFUDA)

Non-Potable Water

Technology	Method	Analyte
LC/MS/MS	Draft EPA Method 1633	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	Draft EPA Method 1633	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	Draft EPA Method 1633	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	Draft EPA Method 1633	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	Draft EPA Method 1633	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	Draft EPA Method 1633	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	Draft EPA Method 1633	Perfluorodecane Sulfonic Acid (PFDS)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctane Sulfonamide (FOSA)
LC/MS/MS	Draft EPA Method 1633	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)
LC/MS/MS	Draft EPA Method 1633	Perfluoropentane Sulfonic acid (PFPS)
LC/MS/MS	Draft EPA Method 1633	Perfluorononane Sulfonic acid (PFNS)
LC/MS/MS	Draft EPA Method 1633	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-2-propoxypropionic acid (GenX Parent Acid) (HFPO-DA)
LC/MS/MS	Draft EPA Method 1633	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	Draft EPA Method 1633	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	Draft EPA Method 1633	Perfluorododecanesulfonic acid (PFDoS
LC/MS/MS	Draft EPA Method 1633	N-Ethylperfluorooctane sulfonamide (EtFOSA)
LC/MS/MS	Draft EPA Method 1633	N-Methylperfluorooctane sulfonamide (MeFOSA)
LC/MS/MS	Draft EPA Method 1633	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)
LC/MS/MS	Draft EPA Method 1633	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)
LC/MS/MS	Draft EPA Method 1633	4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-3-methoxypropanoic acid (PFMPA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-4-methoxybutanoic acid (PFMBA)
LC/MS/MS	Draft EPA Method 1633	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)

Non-Potable Water

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 1
GC/HRMS	EPA 1668A/1668C	PCB 2
GC/HRMS	EPA 1668A/1668C	PCB 3
GC/HRMS	EPA 1668A/1668C	PCB 4
GC/HRMS	EPA 1668A/1668C	PCB 5
GC/HRMS	EPA 1668A/1668C	PCB 6
GC/HRMS	EPA 1668A/1668C	PCB 7
GC/HRMS	EPA 1668A/1668C	PCB 8
GC/HRMS	EPA 1668A/1668C	PCB 9
GC/HRMS	EPA 1668A/1668C	PCB 10
GC/HRMS	EPA 1668A/1668C	PCB 11
GC/HRMS	EPA 1668A/1668C	PCB 12
GC/HRMS	EPA 1668A/1668C	PCB 13
GC/HRMS	EPA 1668A/1668C	PCB 14
GC/HRMS	EPA 1668A/1668C	PCB 15
GC/HRMS	EPA 1668A/1668C	PCB 16
GC/HRMS	EPA 1668A/1668C	PCB 17
GC/HRMS	EPA 1668A/1668C	PCB 18
GC/HRMS	EPA 1668A/1668C	PCB 19
GC/HRMS	EPA 1668A/1668C	PCB 20
GC/HRMS	EPA 1668A/1668C	PCB 21
GC/HRMS	EPA 1668A/1668C	PCB 22
GC/HRMS	EPA 1668A/1668C	PCB 23
GC/HRMS	EPA 1668A/1668C	PCB 24
GC/HRMS	EPA 1668A/1668C	PCB 25
GC/HRMS	EPA 1668A/1668C	PCB 26
GC/HRMS	EPA 1668A/1668C	PCB 27
GC/HRMS	EPA 1668A/1668C	PCB 28
GC/HRMS	EPA 1668A/1668C	PCB 29
GC/HRMS	EPA 1668A/1668C	PCB 30
GC/HRMS	EPA 1668A/1668C	PCB 32
GC/HRMS	EPA 1668A/1668C	PCB 31
GC/HRMS	EPA 1668A/1668C	PCB 33
GC/HRMS	EPA 1668A/1668C	PCB 34
GC/HRMS	EPA 1668A/1668C	PCB 35

Non-Potable Water

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 36
GC/HRMS	EPA 1668A/1668C	PCB 37
GC/HRMS	EPA 1668A/1668C	PCB 38
GC/HRMS	EPA 1668A/1668C	PCB 39
GC/HRMS	EPA 1668A/1668C	PCB 40
GC/HRMS	EPA 1668A/1668C	PCB 41
GC/HRMS	EPA 1668A/1668C	PCB 42
GC/HRMS	EPA 1668A/1668C	PCB 43
GC/HRMS	EPA 1668A/1668C	PCB 44
GC/HRMS	EPA 1668A/1668C	PCB 45
GC/HRMS	EPA 1668A/1668C	PCB 46
GC/HRMS	EPA 1668A/1668C	PCB 47
GC/HRMS	EPA 1668A/1668C	PCB 48
GC/HRMS	EPA 1668A/1668C	PCB 49
GC/HRMS	EPA 1668A/1668C	PCB 50
GC/HRMS	EPA 1668A/1668C	PCB 51
GC/HRMS	EPA 1668A/1668C	PCB 52
GC/HRMS	EPA 1668A/1668C	PCB 53
GC/HRMS	EPA 1668A/1668C	PCB 54
GC/HRMS	EPA 1668A/1668C	PCB 55
GC/HRMS	EPA 1668A/1668C	PCB 56
GC/HRMS	EPA 1668A/1668C	PCB 57
GC/HRMS	EPA 1668A/1668C	PCB 58
GC/HRMS	EPA 1668A/1668C	PCB 59
GC/HRMS	EPA 1668A/1668C	PCB 60
GC/HRMS	EPA 1668A/1668C	PCB 61
GC/HRMS	EPA 1668A/1668C	PCB 62
GC/HRMS	EPA 1668A/1668C	PCB 63
GC/HRMS	EPA 1668A/1668C	PCB 64
GC/HRMS	EPA 1668A/1668C	PCB 65
GC/HRMS	EPA 1668A/1668C	PCB 66
GC/HRMS	EPA 1668A/1668C	PCB 67
GC/HRMS	EPA 1668A/1668C	PCB 68
GC/HRMS	EPA 1668A/1668C	PCB 69
GC/HRMS	EPA 1668A/1668C	PCB 70

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/HRMS	EPA 1668A/1668C	PCB 71
GC/HRMS	EPA 1668A/1668C	PCB 72
GC/HRMS	EPA 1668A/1668C	PCB 73
GC/HRMS	EPA 1668A/1668C	PCB 74
GC/HRMS	EPA 1668A/1668C	PCB 75
GC/HRMS	EPA 1668A/1668C	PCB 76
GC/HRMS	EPA 1668A/1668C	PCB 77
GC/HRMS	EPA 1668A/1668C	PCB 78
GC/HRMS	EPA 1668A/1668C	PCB 79
GC/HRMS	EPA 1668A/1668C	PCB 80
GC/HRMS	EPA 1668A/1668C	PCB 81
GC/HRMS	EPA 1668A/1668C	PCB 82
GC/HRMS	EPA 1668A/1668C	PCB 83
GC/HRMS	EPA 1668A/1668C	PCB 84
GC/HRMS	EPA 1668A/1668C	PCB 85
GC/HRMS	EPA 1668A/1668C	PCB 86
GC/HRMS	EPA 1668A/1668C	PCB 87
GC/HRMS	EPA 1668A/1668C	PCB 88
GC/HRMS	EPA 1668A/1668C	PCB 89
GC/HRMS	EPA 1668A/1668C	PCB 90
GC/HRMS	EPA 1668A/1668C	PCB 91
GC/HRMS	EPA 1668A/1668C	PCB 92
GC/HRMS	EPA 1668A/1668C	PCB 93
GC/HRMS	EPA 1668A/1668C	PCB 94
GC/HRMS	EPA 1668A/1668C	PCB 95
GC/HRMS	EPA 1668A/1668C	PCB 96
GC/HRMS	EPA 1668A/1668C	PCB 97
GC/HRMS	EPA 1668A/1668C	PCB 98
GC/HRMS	EPA 1668A/1668C	PCB 99
GC/HRMS	EPA 1668A/1668C	PCB 100
GC/HRMS	EPA 1668A/1668C	PCB 101
GC/HRMS	EPA 1668A/1668C	PCB 102
GC/HRMS	EPA 1668A/1668C	PCB 103
GC/HRMS	EPA 1668A/1668C	PCB 104
GC/HRMS	EPA 1668A/1668C	PCB 105

Non-Potable Water

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 106
GC/HRMS	EPA 1668A/1668C	PCB 107
GC/HRMS	EPA 1668A/1668C	PCB 108
GC/HRMS	EPA 1668A/1668C	PCB 109
GC/HRMS	EPA 1668A/1668C	PCB 110
GC/HRMS	EPA 1668A/1668C	PCB 111
GC/HRMS	EPA 1668A/1668C	PCB 112
GC/HRMS	EPA 1668A/1668C	PCB 113
GC/HRMS	EPA 1668A/1668C	PCB 114
GC/HRMS	EPA 1668A/1668C	PCB 115
GC/HRMS	EPA 1668A/1668C	PCB 116
GC/HRMS	EPA 1668A/1668C	PCB 117
GC/HRMS	EPA 1668A/1668C	PCB 118
GC/HRMS	EPA 1668A/1668C	PCB 119
GC/HRMS	EPA 1668A/1668C	PCB 120
GC/HRMS	EPA 1668A/1668C	PCB 121
GC/HRMS	EPA 1668A/1668C	PCB 122
GC/HRMS	EPA 1668A/1668C	PCB 123
GC/HRMS	EPA 1668A/1668C	PCB 124
GC/HRMS	EPA 1668A/1668C	PCB 125
GC/HRMS	EPA 1668A/1668C	PCB 126
GC/HRMS	EPA 1668A/1668C	PCB 127
GC/HRMS	EPA 1668A/1668C	PCB 128
GC/HRMS	EPA 1668A/1668C	PCB 129
GC/HRMS	EPA 1668A/1668C	PCB 130
GC/HRMS	EPA 1668A/1668C	PCB 131
GC/HRMS	EPA 1668A/1668C	PCB 132
GC/HRMS	EPA 1668A/1668C	PCB 133
GC/HRMS	EPA 1668A/1668C	PCB 134
GC/HRMS	EPA 1668A/1668C	PCB 135
GC/HRMS	EPA 1668A/1668C	PCB 136
GC/HRMS	EPA 1668A/1668C	PCB 137
GC/HRMS	EPA 1668A/1668C	PCB 138
GC/HRMS	EPA 1668A/1668C	PCB 139
GC/HRMS	EPA 1668A/1668C	PCB 140

Non-Potable Water

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 141
GC/HRMS	EPA 1668A/1668C	PCB 142
GC/HRMS	EPA 1668A/1668C	PCB 143
GC/HRMS	EPA 1668A/1668C	PCB 144
GC/HRMS	EPA 1668A/1668C	PCB 145
GC/HRMS	EPA 1668A/1668C	PCB 146
GC/HRMS	EPA 1668A/1668C	PCB 147
GC/HRMS	EPA 1668A/1668C	PCB 148
GC/HRMS	EPA 1668A/1668C	PCB 149
GC/HRMS	EPA 1668A/1668C	PCB 150
GC/HRMS	EPA 1668A/1668C	PCB 151
GC/HRMS	EPA 1668A/1668C	PCB 152
GC/HRMS	EPA 1668A/1668C	PCB 153
GC/HRMS	EPA 1668A/1668C	PCB 154
GC/HRMS	EPA 1668A/1668C	PCB 155
GC/HRMS	EPA 1668A/1668C	PCB 156
GC/HRMS	EPA 1668A/1668C	PCB 157
GC/HRMS	EPA 1668A/1668C	PCB 158
GC/HRMS	EPA 1668A/1668C	PCB 159
GC/HRMS	EPA 1668A/1668C	PCB 160
GC/HRMS	EPA 1668A/1668C	PCB 161
GC/HRMS	EPA 1668A/1668C	PCB 162
GC/HRMS	EPA 1668A/1668C	PCB 163
GC/HRMS	EPA 1668A/1668C	PCB 164
GC/HRMS	EPA 1668A/1668C	PCB 165
GC/HRMS	EPA 1668A/1668C	PCB 166
GC/HRMS	EPA 1668A/1668C	PCB 167
GC/HRMS	EPA 1668A/1668C	PCB 168
GC/HRMS	EPA 1668A/1668C	PCB 169
GC/HRMS	EPA 1668A/1668C	PCB 170
GC/HRMS	EPA 1668A/1668C	PCB 171
GC/HRMS	EPA 1668A/1668C	PCB 172
GC/HRMS	EPA 1668A/1668C	PCB 173
GC/HRMS	EPA 1668A/1668C	PCB 174
GC/HRMS	EPA 1668A/1668C	PCB 175

Non-Potable Water

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 176
GC/HRMS	EPA 1668A/1668C	PCB 177
GC/HRMS	EPA 1668A/1668C	PCB 178
GC/HRMS	EPA 1668A/1668C	PCB 179
GC/HRMS	EPA 1668A/1668C	PCB 180
GC/HRMS	EPA 1668A/1668C	PCB 181
GC/HRMS	EPA 1668A/1668C	PCB 182
GC/HRMS	EPA 1668A/1668C	PCB 183
GC/HRMS	EPA 1668A/1668C	PCB 184
GC/HRMS	EPA 1668A/1668C	PCB 185
GC/HRMS	EPA 1668A/1668C	PCB 186
GC/HRMS	EPA 1668A/1668C	PCB 187
GC/HRMS	EPA 1668A/1668C	PCB 188
GC/HRMS	EPA 1668A/1668C	PCB 189
GC/HRMS	EPA 1668A/1668C	PCB 190
GC/HRMS	EPA 1668A/1668C	PCB 191
GC/HRMS	EPA 1668A/1668C	PCB 192
GC/HRMS	EPA 1668A/1668C	PCB 193
GC/HRMS	EPA 1668A/1668C	PCB 194
GC/HRMS	EPA 1668A/1668C	PCB 195
GC/HRMS	EPA 1668A/1668C	PCB 196
GC/HRMS	EPA 1668A/1668C	PCB 197
GC/HRMS	EPA 1668A/1668C	PCB 198
GC/HRMS	EPA 1668A/1668C	PCB 199
GC/HRMS	EPA 1668A/1668C	PCB 200
GC/HRMS	EPA 1668A/1668C	PCB 201
GC/HRMS	EPA 1668A/1668C	PCB 202
GC/HRMS	EPA 1668A/1668C	PCB 203
GC/HRMS	EPA 1668A/1668C	PCB 204
GC/HRMS	EPA 1668A/1668C	PCB 205
GC/HRMS	EPA 1668A/1668C	PCB 206
GC/HRMS	EPA 1668A/1668C	PCB 207
GC/HRMS	EPA 1668A/1668C	PCB 208
GC/HRMS	EPA 1668A/1668C	PCB 209

Non-Potable Water

Technology	Method	Analyte
Preparation	**Method**	**Type**
Acid Digestion (Aqueous)	EPA 3005A/3010A	Inorganics
Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	Semivolatile and Non-Volatile Organics
Solid Phase Extraction	EPA 3535A	Semivolatile and Non-Volatile Organics
Purge and Trap	EPA 5030B/5030C	Volatile Organic Compounds
Florisil Cleanup	EPA 3620B/3620C	Cleanup of pesticide residues and other chlorinated hydrocarbons
Sulfur Cleanup	EPA 3660A	Sulfur Cleanup
Sulfuric Acid Cleanup	EPA 3665A	Sulfuric Acid Cleanup for PCBs
Silica Gel Cleanup	EPA 3630C	Column Cleanup

Drinking Water

Technology	Method	Analyte
LC/MS/MS	EPA 537	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	EPA 537	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	EPA 537	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	EPA 537	Perfluorononanoic acid (PFNA)
LC/MS/MS	EPA 537	Perfluorooctanoic acid (PFOA)
LC/MS/MS	EPA 537	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	EPA 537	Perfluorodecanoic acid (PFDA)
LC/MS/MS	EPA 537	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	EPA 537	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	EPA 537	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	EPA 537	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	EPA 537	Perfluoroundecanoic acid (PFUDA)
LC/MS/MS	EPA 537	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	EPA 537	N-Methyl perfluorooctanesulfon amidoacetic acid (MeFOSAA)
LC/MS/MS	EPA 537.1	Perfluorodecanoic acid (PFDA)
LC/MS/MS	EPA 537.1	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	EPA 537.1	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	EPA 537.1	Perfluorotetradecanoic acid (PDTeA)

Drinking Water		
Technology	**Method**	**Analyte**
LC/MS/MS	EPA 537.1	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	EPA 537.1	Perfluoroundecanoic acid (PFUDA)
LC/MS/MS	EPA 537.1	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	EPA 537.1	N-Methyl perfluorooctanesulfon amidoacetic acid (MeFOSAA)
LC/MS/MS	EPA 537.1	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	EPA 537.1	Perfluorooctanoic acid (PFOA)
LC/MS/MS	EPA 537.1	Perfluorononanoic acid (PFNA)
LC/MS/MS	EPA 537.1	Perfluorobutanesulfonic acid (PFBS)
LC/MS/MS	EPA 537.1	Perfluorohexanesulfonic acid (PFHxS)
LC/MS/MS	EPA 537.1	Perfluorooctanesulfonic acid (PFOS)
LC/MS/MS	EPA 537.1	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)
LC/MS/MS	EPA 537.1	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	EPA 537.1	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	EPA 537.1	4,8-Dioxa-3H-perfluoronanoic Acid (ADONA)
LC/MS/MS	EPA 533	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	EPA 533	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	EPA 533	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)
LC/MS/MS	EPA 533	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	EPA 533	4,8-Dioxa-3H-perfluorononanoic acid (DONA)
LC/MS/MS	EPA 533	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	EPA 533	Perfluoro-2-propoxypropionic acid (HFPO-DA)
LC/MS/MS	EPA 533	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
LC/MS/MS	EPA 533	Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)

Drinking Water		
Technology	**Method**	**Analyte**
LC/MS/MS	EPA 533	Perfluoro-3-methoxypropanoic acid (PFMPA)
LC/MS/MS	EPA 533	Perfluoro-4-methoxybutanoic acid (PFMBA)
LC/MS/MS	EPA 533	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	EPA 533	Perfluorobutanoic acid (PFBA)
LC/MS/MS	EPA 533	Perfluorodecanoic acid (PFDA)
LC/MS/MS	EPA 533	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	EPA 533	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	EPA 533	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	EPA 533	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	EPA 533	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	EPA 533	Perfluorononanoic acid (PFNA)
LC/MS/MS	EPA 533	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	EPA 533	Perfluorooctanoic acid (PFOA)
LC/MS/MS	EPA 533	Perfluoropentane Sulfonic acid (PFPeS)
LC/MS/MS	EPA 533	Perfluoropentanoic acid (PFPeA)
LC/MS/MS	EPA 533	Perfluoroundecanoic acid (PFUDA)
Preparation	**Method**	**Type**
Solid Phase Extraction	EPA 537/537.1/533	Perfluoro compounds in Drinking Water

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C	Aluminum
ICP-AES	EPA 6010B/6010C	Antimony
ICP-AES	EPA 6010B/6010C	Arsenic
ICP-AES	EPA 6010B/6010C	Barium
ICP-AES	EPA 6010B/6010C	Beryllium
ICP-AES	EPA 6010B/6010C	Boron
ICP-AES	EPA 6010B/6010C	Cadmium
ICP-AES	EPA 6010B/6010C	Calcium
ICP-AES	EPA 6010B/6010C	Chromium (Total)
ICP-AES	EPA 6010B/6010C	Cobalt
ICP-AES	EPA 6010B/6010C	Copper

Solid and Chemical Materials

Technology	Method	Analyte
ICP-AES	EPA 6010B/6010C	Iron
ICP-AES	EPA 6010B/6010C	Lead
ICP-AES	EPA 6010B/6010C	Magnesium
ICP-AES	EPA 6010B/6010C	Manganese
ICP-AES	EPA 6010B/6010C	Molybdenum
ICP-AES	EPA 6010B/6010C	Nickel
ICP-AES	EPA 6010B/6010C	Potassium
ICP-AES	EPA 6010B/6010C	Selenium
ICP-AES	EPA 6010B/6010C	Silver
ICP-AES	EPA 6010B/6010C	Sodium
ICP-AES	EPA 6010B/6010C	Thallium
ICP-AES	EPA 6010B/6010C	Tin
ICP-AES	EPA 6010B/6010C	Titanium
ICP-AES	EPA 6010B/6010C	Vanadium
ICP-AES	EPA 6010B/6010C	Zinc
ICP-MS	EPA 6020/6020A	Aluminum
ICP-MS	EPA 6020/6020A	Antimony
ICP-MS	EPA 6020/6020A	Arsenic
ICP-MS	EPA 6020/6020A	Barium
ICP-MS	EPA 6020/6020A	Beryllium
ICP-MS	EPA 6020/6020A	Cadmium
ICP-MS	EPA 6020/6020A	Calcium
ICP-MS	EPA 6020/6020A	Chromium (Total)
ICP-MS	EPA 6020/6020A	Cobalt
ICP-MS	EPA 6020/6020A	Copper
ICP-MS	EPA 6020/6020A	Iron
ICP-MS	EPA 6020/6020A	Lead
ICP-MS	EPA 6020/6020A	Magnesium
ICP-MS	EPA 6020/6020A	Manganese
ICP-MS	EPA 6020/6020A	Molybdenum
ICP-MS	EPA 6020/6020A	Nickel
ICP-MS	EPA 6020/6020A	Phosphorus
ICP-MS	EPA 6020/6020A	Potassium
ICP-MS	EPA 6020/6020A	Selenium
ICP-MS	EPA 6020/6020A	Silver

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-MS	EPA 6020/6020A	Sodium
ICP-MS	EPA 6020/6020A	Strontium
ICP-MS	EPA 6020/6020A	Thallium
ICP-MS	EPA 6020/6020A	Tin
ICP-MS	EPA 6020/6020A	Titanium
ICP-MS	EPA 6020/6020A	Uranium
ICP-MS	EPA 6020/6020A	Vanadium
ICP-MS	EPA 6020/6020A	Zinc
CVAAS	EPA 7470A/7471A/7471B	Mercury
Colorimetric/Hydrolysis	EPA 353.2 Modified WS-WC-0050	Nitrocellulose
LC/MS/MS	EPA 6850	Perchlorate
Probe	EPA 9045C/9045D	pH
Ion Chromatography	EPA 9056A/300.0	Bromide
Ion Chromatography	EPA 9056A/300.0	Chloride
Ion Chromatography	EPA 9056A/300.0	Fluoride
Ion Chromatography	EPA 9056A/300.0	Sulfate
Ion Chromatography	EPA 9056A/300.0	Nitrate
Ion Chromatography	EPA 9056A/300.0	Nitrite
Gravimetric	ASTM D2216	%Moisture
GC/MS	EPA 8260B/8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethene
GC/MS	EPA 8260B/8260C	1,1-Dichloropropene
GC/MS	EPA 8260B/8260C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,2-Dibromo-3-chloropropane
GC/MS	EPA 8260B/8260C	1,2-Dibromoethane
GC/MS	EPA 8260B/8260C	1,2-Dichlorobenzene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	1,2-Dichloroethane
GC/MS	EPA 8260B/8260C	1,2-Dichloropropane
GC/MS	EPA 8260B/8260C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,3-Dichloropropane
GC/MS	EPA 8260B/8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1-Chlorohexane
GC/MS	EPA 8260B/8260C	2,2-Dichloropropane
GC/MS	EPA 8260B/8260C	2-Butanone (MEK)
GC/MS	EPA 8260B/8260C	2-Chlorotoluene
GC/MS	EPA 8260B/8260C	2-Hexanone (MBK)
GC/MS	EPA 8260B/8260C	2-Methyl-2-propanol (tert- Butyl Alcohol, TBA)
GC/MS	EPA 8260B/8260C	4-Chlorotoluene
GC/MS	EPA 8260B/8260C	4-Isopropyltoluene
GC/MS	EPA 8260B/8260C	4-Methyl-2-pentanone (MIBK)
GC/MS	EPA 8260B/8260C	Acetone
GC/MS	EPA 8260B/8260C	Allyl Chloride
GC/MS	EPA 8260B/8260C	Benzene
GC/MS	EPA 8260B/8260C	Bromobenzene
GC/MS	EPA 8260B/8260C	Bromochloromethane
GC/MS	EPA 8260B/8260C	Bromodichloromethane
GC/MS	EPA 8260B/8260C	Bromoform
GC/MS	EPA 8260B/8260C	Bromomethane
GC/MS	EPA 8260B/8260C	Carbon Disulfide
GC/MS	EPA 8260B/8260C	Carbon Tetrachloride
GC/MS	EPA 8260B/8260C	Chlorobenzene
GC/MS	EPA 8260B/8260C	Chloroethane
GC/MS	EPA 8260B/8260C	Chloroform
GC/MS	EPA 8260B/8260C	Chloromethane
GC/MS	EPA 8260B/8260C	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Cyclohexane
GC/MS	EPA 8260B/8260C	Dibromochloromethane
GC/MS	EPA 8260B/8260C	Dibromomethane
GC/MS	EPA 8260B/8260C	Dichlorodifluoromethane

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8260B/8260C	Diisopropyl Ether (DIPE)
GC/MS	EPA 8260B/8260C	Ethylbenzene
GC/MS	EPA 8260B/8260C	Ethylmethacrylate
GC/MS	EPA 8260B/8260C	Ethyl tert-butyl Ether (ETBE)
GC/MS	EPA 8260B/8260C	Hexachlorobutadiene
GC/MS	EPA 8260B/8260C	Hexane
GC/MS	EPA 8260B/8260C	Iodomethane
GC/MS	EPA 8260B/8260C	Isobutanol (2-Methyl-1-propanol)
GC/MS	EPA 8260B/8260C	Isopropylbenzene
GC/MS	EPA 8260B/8260C	m & p Xylene
GC/MS	EPA 8260B/8260C	Methyl tert-butyl Ether (MTBE)
GC/MS	EPA 8260B/8260C	Methylene Chloride
GC/MS	EPA 8260B/8260C	Naphthalene
GC/MS	EPA 8260B/8260C	n-Butylbenzene
GC/MS	EPA 8260B/8260C	n-Propylbenzene
GC/MS	EPA 8260B/8260C	o-Xylene
GC/MS	EPA 8260B/8260C	sec-Butylbenzene
GC/MS	EPA 8260B/8260C	Styrene
GC/MS	EPA 8260B/8260C	t-Amyl methyl Ether (TAME)
GC/MS	EPA 8260B/8260C	t-1,4-Dichloro-2-Butene
GC/MS	EPA 8260B/8260C	tert-Butylbenzene
GC/MS	EPA 8260B/8260C	Tetrachloroethene
GC/MS	EPA 8260B/8260C	Toluene
GC/MS	EPA 8260B/8260C	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C	trans-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Trichloroethene
GC/MS	EPA 8260B/8260C	Trichlorofluoromethane
GC/MS	EPA 8260B/8260C	Vinyl Acetate
GC/MS	EPA 8260B/8260C	Vinyl Chloride
GC/MS	EPA 8260B/8260C	Xylenes, Total
GC/MS	EPA 8260B/AK101MS	Gasoline Range Organics (GRO)
GC/MS	EPA 8270C/8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/8270D	1,2-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1,2-Diphenylhydrazine (as Azobenzene)

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8270C/8270D	1,3-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1,3-Dinitrobenzene
GC/MS	EPA 8270C/8270D	1,4-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1-Methylnaphthalene
GC/MS	EPA 8270C/8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/8270D	2,4-Dichlorophenol
GC/MS	EPA 8270C/8270D	2,4-Dimethylphenol
GC/MS	EPA 8270C/8270D	2,4-Dinitrophenol
GC/MS	EPA 8270C/8270D	2,4-Dinitrotoluene
GC/MS	EPA 8270C/8270D	2,6-Dichlorophenol
GC/MS	EPA 8270C/8270D	2,6-Dinitrotoluene
GC/MS	EPA 8270C/8270D	2-Chloronaphthalene
GC/MS	EPA 8270C/8270D	2-Chlorophenol
GC/MS	EPA 8270C/8270D	2-Methylnaphthalene
GC/MS	EPA 8270C/8270D	2-Methylphenol
GC/MS	EPA 8270C/8270D	2-Nitroaniline
GC/MS	EPA 8270C/8270D	2-Nitrophenol
GC/MS	EPA 8270C/8270D	3&4-Methylphenol
GC/MS	EPA 8270C/8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/8270D	3-Nitroaniline
GC/MS	EPA 8270C/8270D	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/8270D	4-Chloroaniline
GC/MS	EPA 8270C/8270D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/8270D	4-Nitroaniline
GC/MS	EPA 8270C/8270D	4-Nitrophenol
GC/MS	EPA 8270C/8270D	Acenaphthene
GC/MS	EPA 8270C/8270D	Acenaphthylene
GC/MS	EPA 8270C/8270D	Aniline
GC/MS	EPA 8270C/8270D	Anthracene
GC/MS	EPA 8270C/8270D	Benzo(a)anthracene
GC/MS	EPA 8270C/8270D	Benzo(a)pyrene

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8270C/8270D	Benzo(b)fluoranthene
GC/MS	EPA 8270C/8270D	Benzo(g,h,i)perylene
GC/MS	EPA 8270C/8270D	Benzo(k)fluoranthene
GC/MS	EPA 8270C/8270D	Benzoic Acid
GC/MS	EPA 8270C/8270D	Benzyl Alcohol
GC/MS	EPA 8270C/8270D	Benzyl butyl Phthalate
GC/MS	EPA 8270C/8270D	Biphenyl
GC/MS	EPA 8270C/8270D	Bis(2-chloroethoxy) Methane
GC/MS	EPA 8270C/8270D	Bis(2-chloroethyl) Ether
GC/MS	EPA 8270C/8270D	Bis(2-chloroisopropyl) Ether
GC/MS	EPA 8270C/8270D	Carbazole
GC/MS	EPA 8270C/8270D	Chrysene
GC/MS	EPA 8270C/8270D	Bis (2-ethylhexyl) Phthalate
GC/MS	EPA 8270C/8270D	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/8270D	Dibenzofuran
GC/MS	EPA 8270C/8270D	Diethyl Phthalate
GC/MS	EPA 8270C/8270D	Dimethyl Phthalate
GC/MS	EPA 8270C/8270D	Di-n-butyl Phthalate
GC/MS	EPA 8270C/8270D	Di-n-octyl Phthalate
GC/MS	EPA 8270C/8270D	Fluoranthene
GC/MS	EPA 8270C/8270D	Fluorene
GC/MS	EPA 8270C/8270D	Hexachlorobenzene
GC/MS	EPA 8270C/8270D	Hexachlorobutadiene
GC/MS	EPA 8270C/8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/8270D	Hexachloroethane
GC/MS	EPA 8270C/8270D	Indeno(1,2,3-c,d) Pyrene
GC/MS	EPA 8270C/8270D	Isophorone
GC/MS	EPA 8270C/8270D	Naphthalene
GC/MS	EPA 8270C/8270D	Nitrobenzene
GC/MS	EPA 8270C/8270D	n-Nitrosodimethylamine
GC/MS	EPA 8270C/8270D	n-Nitrosodi-n-propylamine
GC/MS	EPA 8270C/8270D	n-Nitrosodiphenylamine
GC/MS	EPA 8270C/8270D	Pentachlorophenol
GC/MS	EPA 8270C/8270D	Phenanthrene
GC/MS	EPA 8270C/8270D	Phenol

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270D	Pyrene
GC/MS	EPA 8270C/8270D	Pyridine
GC/MS SIM	EPA 8260C-SIM	1,1,2-Trichloroethane
GC/MS SIM	EPA 8260C-SIM	1,1,2,2-Tetrachloroethane
GC/MS SIM	EPA 8260C-SIM	1,2,3-Trichloropropane
GC/MS SIM	EPA 8260C-SIM	1,2-Dibromoethane
GC/MS SIM	EPA 8260C-SIM	1,2-Dichloroethane
GC/MS SIM	EPA 8260C-SIM	1,3-Butadiene
GC/MS SIM	EPA 8260C-SIM	1,4-Dichlorobenzene
GC/MS SIM	EPA 8260C-SIM	Benzene
GC/MS SIM	EPA 8260C-SIM	Bromodichloromethane
GC/MS SIM	EPA 8260C-SIM	Bromoform
GC/MS SIM	EPA 8260C-SIM	Bromomethane
GC/MS SIM	EPA 8260C-SIM	Chloroform
GC/MS SIM	EPA 8260C-SIM	Dibromochloromethane
GC/MS SIM	EPA 8260C-SIM	Dibromomethane
GC/MS SIM	EPA 8260C-SIM	Hexachlorobutadiene
GC/MS SIM	EPA 8260C-SIM	Naphthalene
GC/MS SIM	EPA 8260C-SIM	Tetrachloroethene
GC/MS SIM	EPA 8260C-SIM	Trichloroethene
GC/MS SIM	EPA 8260C-SIM	Vinyl Chloride
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	1-Methylnaphthalene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	2-Methylnaphthalene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Acenaphthene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Acenaphthylene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Anthracene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(a)anthracene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(a)pyrene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(b)fluoranthene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(g,h,i)perylene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Benzo(k)fluoranthene
GC/MS SIM	EPA 8270D-SIM	Bis(2-chloroethyl) Ether
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Chrysene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Dibenz(a,h)anthracene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Fluoranthene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Fluorene
GC/MS SIM	EPA 8270D-SIM	Hexachlorobenzene
GC/MS SIM	EPA 8270D-SIM	Hexachlorocyclopentadiene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Indeno(1,2,3-c,d) Pyrene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Naphthalene
GC/MS SIM	EPA 8270D-SIM	n-Nitrosodi-n-propylamine
GC/MS SIM	EPA 8270D-SIM	Pentachlorophenol
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Phenanthrene
GC/MS SIM	EPA 8270C-SIM EPA 8270D-SIM	Pyrene
GC-FID	EPA 8015B/8015C/8015D AK102	Diesel Range Organics (DRO)
GC-FID	AK103	Residual Range Organics
GC-FID	EPA 8015B/8015C/8015D	Motor Oil Range Organics (MRO)
GC-ECD	EPA 8081A/8081B	Aldrin
GC-ECD	EPA 8081A/8081B	a-BHC
GC-ECD	EPA 8081A/8081B	b-BHC
GC-ECD	EPA 8081A/8081B	d-BHC
GC-ECD	EPA 8081A/8081B	g-BHC (Lindane)
GC-ECD	EPA 8081A/8081B	a-Chlordane
GC-ECD	EPA 8081A/8081B	g-Chlordane
GC-ECD	EPA 8081A/8081B	4,4'-DDD
GC-ECD	EPA 8081A/8081B	4,4'-DDE

Solid and Chemical Materials

Technology	Method	Analyte
GC-ECD	EPA 8081A/8081B	4,4'-DDT
GC-ECD	EPA 8081A/8081B	Dieldrin
GC-ECD	EPA 8081A/8081B	Endosulfan I
GC-ECD	EPA 8081A/8081B	Endosulfan II
GC-ECD	EPA 8081A/8081B	Endosulfan sulfate
GC-ECD	EPA 8081A/8081B	Endrin
GC-ECD	EPA 8081A/8081B	Endrin Aldehyde
GC-ECD	EPA 8081A/8081B	Endrin Ketone
GC-ECD	EPA 8081A/8081B	Heptachlor
GC-ECD	EPA 8081A/8081B	Heptachlor Epoxide
GC-ECD	EPA 8081A/8081B	Methoxychlor
GC-ECD	EPA 8081A/8081B	Toxaphene
GC-ECD	EPA 8081A/8081B	Chlordane (technical)
GC-ECD	EPA 8082/8082A	PCB-1016
GC-ECD	EPA 8082/8082A	PCB-1221
GC-ECD	EPA 8082/8082A	PCB-1232
GC-ECD	EPA 8082/8082A	PCB-1242
GC-ECD	EPA 8082/8082A	PCB-1248
GC-ECD	EPA 8082/8082A	PCB-1254
GC-ECD	EPA 8082/8082A	PCB-1260
GC-ECD	EPA 8082/8082A	PCB-1262
GC-ECD	EPA 8082/8082A	PCB-1268
GC/MS	EPA 8280A/8280B	2,3,7,8-TeCDD
GC/MS	EPA 8280A/8280B	1,2,3,7,8-PeCDD
GC/MS	EPA 8280A/8280B	1,2,3,4,7,8-HxCDD
GC/MS	EPA 8280A/8280B	1,2,3,6,7,8-HxCDD
GC/MS	EPA 8280A/8280B	1,2,3,7,8,9-HxCDD
GC/MS	EPA 8280A/8280B	1,2,3,4,6,7,8-HpCDD
GC/MS	EPA 8280A/8280B	OCDD
GC/MS	EPA 8280A/8280B	2,3,7,8-TeCDF
GC/MS	EPA 8280A/8280B	1,2,3,7,8-PeCDF
GC/MS	EPA 8280A/8280B	2,3,4,7,8-PeCDF
GC/MS	EPA 8280A/8280B	1,2,3,4,7,8-HxCDF
GC/MS	EPA 8280A/8280B	1,2,3,6,7,8-HxCDF
GC/MS	EPA 8280A/8280B	1,2,3,7,8,9-HxCDF

Solid and Chemical Materials

Technology	Method	Analyte
GC/MS	EPA 8280A/8280B	2,3,4,6,7,8-HxCDF
GC/MS	EPA 8280A/8280B	1,2,3,4,6,7,8-HpCDF
GC/MS	EPA 8280A/8280B	1,2,3,4,7,8,9-HpCDF
GC/MS	EPA 8280A/8280B	OCDF
GC/MS	EPA 8280A/8280B	Total TCDD
GC/MS	EPA 8280A/8280B	Total PeCDD
GC/MS	EPA 8280A/8280B	Total HxCDD
GC/MS	EPA 8280A/8280B	Total HeptaCDD
GC/MS	EPA 8280A/8280B	Total TCDF
GC/MS	EPA 8280A/8280B	Total PeCDF
GC/MS	EPA 8280A/8280B	Total HxCDF
GC/MS	EPA 8280A/8280B	Total HpCDF
GC/HRMS	EPA 8290/ 8290A/1613B	2,3,7,8-TeCDD
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,7,8-PeCDD
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,4,7,8-HxCDD
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,6,7,8-HxCDD
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,7,8,9-HxCDD
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,4,6,7,8-HpCDD
GC/HRMS	EPA 8290/ 8290A/1613B	OCDD
GC/HRMS	EPA 8290/ 8290A/1613B	2,3,7,8-TeCDF
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,7,8-PeCDF
GC/HRMS	EPA 8290/ 8290A/1613B	2,3,4,7,8-PeCDF
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,4,7,8-HxCDF
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,6,7,8-HxCDF
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,7,8,9-HxCDF
GC/HRMS	EPA 8290/ 8290A/1613B	2,3,4,6,7,8-HxCDF
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,4,6,7,8-HpCDF
GC/HRMS	EPA 8290/ 8290A/1613B	1,2,3,4,7,8,9-HpCDF
GC/HRMS	EPA 8290/ 8290A/1613B	OCDF
GC/HRMS	EPA 8290/ 8290A/1613B	Total TCDD
GC/HRMS	EPA 8290/ 8290A/1613B	Total PeCDD
GC/HRMS	EPA 8290/ 8290A/1613B	Total HxCDD
GC/HRMS	EPA 8290/ 8290A/1613B	Total HpCDD
GC/HRMS	EPA 8290/ 8290A/1613B	Total TCDF
GC/HRMS	EPA 8290/ 8290A/1613B	Total PeCDF

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/HRMS	EPA 8290/ 8290A/1613B	Total HxCDF
GC/HRMS	EPA 8290/ 8290A/1613B	Total HpCDF
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methyl perfluorooctanesulfon amidoacetic acide (MeFOSAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctanoic acid (PFOA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorobutyric acid (PFBA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropentanoic acid (PFPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexanoic acid (PFHxA)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorononanoic acid (PFNA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorodecanoic acid (PFDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroundecanoic acid (PFUDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexane Sulfonic Acid (PFHxS)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorodecane Sulfonic Acid (PFDS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctane Sulfonamide (FOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	10:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorododecane sulfonic acid) (10:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexadecanoic acid (PFHxDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropentane Sulfonic acid (PFPS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorononane Sulfonic acid (PFNS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)

Solid and Chemical Materials

Technology	Method	Analyte
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-propoxypropionic acid (GenX Parent Acid) (HFPO-DA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorododecanesulfonic acid (PFDoS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctadecanoic acid (PFODA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-4-ethylcyclohexanesulfonic acid (PFecHS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-1-propanesulfonic acid (PFPrS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethylperfluorooctane sulfonamide (EtFOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methylperfluorooctane sulfonamide (MeFOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2-Perfluorohexylethanoic acid (6:2 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2-Perfluorooctylethanoic acid (8:2 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2-Perfluorodecylethanoic acid (10:2 FTCA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropropionic acid (PPF Acid, PFPrA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3-methoxypropanoic acid (PFMPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-4-methoxybutanoic acid (PFMBA)

Solid and Chemical Materials

Technology	Method	Analyte
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Difluoro(perfluoromethoxy)acetic acid (PFMOAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-4-isopropoxybutanoic acid (PFECA G, PFPE-1)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5,7,9-butaoxadecanoic acid (PFO4DA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5,7-trioxaoctanoic acid (PFO3OA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5-dioxahexanoic acid (PFO2HXA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-{[perfluoro-3-(perfluoroethoxy)-2-propanyl]oxy}ethanesulfonic acid (Hydro-PS Acid)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DoA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2,3,3,3-Tetrafluoro-2-(pentafluoroethoxy)propanoic acid (PEPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4-(2-carboxy-1,1,2,2-tetrafluoroethoxy)-2,2,3,3,4,5,5,5-octafluoro-pentanoic acid (R-EVE)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	,1,2,2-Tetrafluoro-2-(1,2,2,2-tetrafluoroethoxy)ethane-1-sulfonic acid (NVHOS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	2,2,3,3-Tetrafluoro-3-{[1,1,1,2,3,3-hexafluoro-3-(1,2,2,2-tetrafluoroethoxy)propan-2-yl]oxy}propanoic acid (Hydro-EVE Acid)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy]ethanesulfonic acid (R-PSDCA)
LC/MS/MS	Draft EPA Method 1633	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	Draft EPA Method 1633	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	Draft EPA Method 1633	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	Draft EPA Method 1633	N-Methyl perfluorooctanesulfon amidoacetic acide (MeFOSAA)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctanoic acid (PFOA)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	Draft EPA Method 1633	Perfluorobutyric acid (PFBA)
LC/MS/MS	Draft EPA Method 1633	Perfluoropentanoic acid (PFPA)
LC/MS/MS	Draft EPA Method 1633	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	Draft EPA Method 1633	Perfluoroheptanoic acid (PFHpA)
LC/MS/MS	Draft EPA Method 1633	Perfluorononanoic acid (PFNA)
LC/MS/MS	Draft EPA Method 1633	Perfluorodecanoic acid (PFDA)
LC/MS/MS	Draft EPA Method 1633	Perfluoroundecanoic acid (PFUDA)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
LC/MS/MS	Draft EPA Method 1633	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	Draft EPA Method 1633	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	Draft EPA Method 1633	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	Draft EPA Method 1633	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	Draft EPA Method 1633	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	Draft EPA Method 1633	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	Draft EPA Method 1633	Perfluorodecane Sulfonic Acid (PFDS)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctane Sulfonamide (FOSA)
LC/MS/MS	Draft EPA Method 1633	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)
LC/MS/MS	Draft EPA Method 1633	Perfluoropentane Sulfonic acid (PFPS)
LC/MS/MS	Draft EPA Method 1633	Perfluorononane Sulfonic acid (PFNS)
LC/MS/MS	Draft EPA Method 1633	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-2-propoxypropionic acid (GenX Parent Acid) (HFPO-DA)
LC/MS/MS	Draft EPA Method 1633	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	Draft EPA Method 1633	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	Draft EPA Method 1633	Perfluorododecanesulfonic acid (PFDoS)
LC/MS/MS	Draft EPA Method 1633	N-Ethylperfluorooctane sulfonamide (EtFOSA)
LC/MS/MS	Draft EPA Method 1633	N-Methylperfluorooctane sulfonamide (MeFOSA)
LC/MS/MS	Draft EPA Method 1633	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)
LC/MS/MS	Draft EPA Method 1633	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)
LC/MS/MS	Draft EPA Method 1633	4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-3-methoxypropanoic acid (PFMPA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-4-methoxybutanoic acid (PFMBA)
LC/MS/MS	Draft EPA Method 1633	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)

Solid and Chemical Materials

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 1
GC/HRMS	EPA 1668A/1668C	PCB 2
GC/HRMS	EPA 1668A/1668C	PCB 3
GC/HRMS	EPA 1668A/1668C	PCB 4
GC/HRMS	EPA 1668A/1668C	PCB 5
GC/HRMS	EPA 1668A/1668C	PCB 6
GC/HRMS	EPA 1668A/1668C	PCB 7
GC/HRMS	EPA 1668A/1668C	PCB 8
GC/HRMS	EPA 1668A/1668C	PCB 9
GC/HRMS	EPA 1668A/1668C	PCB 10
GC/HRMS	EPA 1668A/1668C	PCB 11
GC/HRMS	EPA 1668A/1668C	PCB 12
GC/HRMS	EPA 1668A/1668C	PCB 13
GC/HRMS	EPA 1668A/1668C	PCB 14
GC/HRMS	EPA 1668A/1668C	PCB 15
GC/HRMS	EPA 1668A/1668C	PCB 16
GC/HRMS	EPA 1668A/1668C	PCB 17
GC/HRMS	EPA 1668A/1668C	PCB 18
GC/HRMS	EPA 1668A/1668C	PCB 19
GC/HRMS	EPA 1668A/1668C	PCB 20
GC/HRMS	EPA 1668A/1668C	PCB 21
GC/HRMS	EPA 1668A/1668C	PCB 22
GC/HRMS	EPA 1668A/1668C	PCB 23
GC/HRMS	EPA 1668A/1668C	PCB 24
GC/HRMS	EPA 1668A/1668C	PCB 25
GC/HRMS	EPA 1668A/1668C	PCB 26
GC/HRMS	EPA 1668A/1668C	PCB 27
GC/HRMS	EPA 1668A/1668C	PCB 28
GC/HRMS	EPA 1668A/1668C	PCB 29
GC/HRMS	EPA 1668A/1668C	PCB 30
GC/HRMS	EPA 1668A/1668C	PCB 32
GC/HRMS	EPA 1668A/1668C	PCB 31
GC/HRMS	EPA 1668A/1668C	PCB 33
GC/HRMS	EPA 1668A/1668C	PCB 34
GC/HRMS	EPA 1668A/1668C	PCB 35

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/HRMS	EPA 1668A/1668C	PCB 36
GC/HRMS	EPA 1668A/1668C	PCB 37
GC/HRMS	EPA 1668A/1668C	PCB 38
GC/HRMS	EPA 1668A/1668C	PCB 39
GC/HRMS	EPA 1668A/1668C	PCB 40
GC/HRMS	EPA 1668A/1668C	PCB 41
GC/HRMS	EPA 1668A/1668C	PCB 42
GC/HRMS	EPA 1668A/1668C	PCB 43
GC/HRMS	EPA 1668A/1668C	PCB 44
GC/HRMS	EPA 1668A/1668C	PCB 45
GC/HRMS	EPA 1668A/1668C	PCB 46
GC/HRMS	EPA 1668A/1668C	PCB 47
GC/HRMS	EPA 1668A/1668C	PCB 48
GC/HRMS	EPA 1668A/1668C	PCB 49
GC/HRMS	EPA 1668A/1668C	PCB 50
GC/HRMS	EPA 1668A/1668C	PCB 51
GC/HRMS	EPA 1668A/1668C	PCB 52
GC/HRMS	EPA 1668A/1668C	PCB 53
GC/HRMS	EPA 1668A/1668C	PCB 54
GC/HRMS	EPA 1668A/1668C	PCB 55
GC/HRMS	EPA 1668A/1668C	PCB 56
GC/HRMS	EPA 1668A/1668C	PCB 57
GC/HRMS	EPA 1668A/1668C	PCB 58
GC/HRMS	EPA 1668A/1668C	PCB 59
GC/HRMS	EPA 1668A/1668C	PCB 60
GC/HRMS	EPA 1668A/1668C	PCB 61
GC/HRMS	EPA 1668A/1668C	PCB 62
GC/HRMS	EPA 1668A/1668C	PCB 63
GC/HRMS	EPA 1668A/1668C	PCB 64
GC/HRMS	EPA 1668A/1668C	PCB 65
GC/HRMS	EPA 1668A/1668C	PCB 66
GC/HRMS	EPA 1668A/1668C	PCB 67
GC/HRMS	EPA 1668A/1668C	PCB 68
GC/HRMS	EPA 1668A/1668C	PCB 69
GC/HRMS	EPA 1668A/1668C	PCB 70

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/HRMS	EPA 1668A/1668C	PCB 71
GC/HRMS	EPA 1668A/1668C	PCB 72
GC/HRMS	EPA 1668A/1668C	PCB 73
GC/HRMS	EPA 1668A/1668C	PCB 74
GC/HRMS	EPA 1668A/1668C	PCB 75
GC/HRMS	EPA 1668A/1668C	PCB 76
GC/HRMS	EPA 1668A/1668C	PCB 77
GC/HRMS	EPA 1668A/1668C	PCB 78
GC/HRMS	EPA 1668A/1668C	PCB 79
GC/HRMS	EPA 1668A/1668C	PCB 80
GC/HRMS	EPA 1668A/1668C	PCB 81
GC/HRMS	EPA 1668A/1668C	PCB 82
GC/HRMS	EPA 1668A/1668C	PCB 83
GC/HRMS	EPA 1668A/1668C	PCB 84
GC/HRMS	EPA 1668A/1668C	PCB 85
GC/HRMS	EPA 1668A/1668C	PCB 86
GC/HRMS	EPA 1668A/1668C	PCB 87
GC/HRMS	EPA 1668A/1668C	PCB 88
GC/HRMS	EPA 1668A/1668C	PCB 89
GC/HRMS	EPA 1668A/1668C	PCB 90
GC/HRMS	EPA 1668A/1668C	PCB 91
GC/HRMS	EPA 1668A/1668C	PCB 92
GC/HRMS	EPA 1668A/1668C	PCB 93
GC/HRMS	EPA 1668A/1668C	PCB 94
GC/HRMS	EPA 1668A/1668C	PCB 95
GC/HRMS	EPA 1668A/1668C	PCB 96
GC/HRMS	EPA 1668A/1668C	PCB 97
GC/HRMS	EPA 1668A/1668C	PCB 98
GC/HRMS	EPA 1668A/1668C	PCB 99
GC/HRMS	EPA 1668A/1668C	PCB 100
GC/HRMS	EPA 1668A/1668C	PCB 101
GC/HRMS	EPA 1668A/1668C	PCB 102
GC/HRMS	EPA 1668A/1668C	PCB 103
GC/HRMS	EPA 1668A/1668C	PCB 104
GC/HRMS	EPA 1668A/1668C	PCB 105

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/HRMS	EPA 1668A/1668C	PCB 106
GC/HRMS	EPA 1668A/1668C	PCB 107
GC/HRMS	EPA 1668A/1668C	PCB 108
GC/HRMS	EPA 1668A/1668C	PCB 109
GC/HRMS	EPA 1668A/1668C	PCB 110
GC/HRMS	EPA 1668A/1668C	PCB 111
GC/HRMS	EPA 1668A/1668C	PCB 112
GC/HRMS	EPA 1668A/1668C	PCB 113
GC/HRMS	EPA 1668A/1668C	PCB 114
GC/HRMS	EPA 1668A/1668C	PCB 115
GC/HRMS	EPA 1668A/1668C	PCB 116
GC/HRMS	EPA 1668A/1668C	PCB 117
GC/HRMS	EPA 1668A/1668C	PCB 118
GC/HRMS	EPA 1668A/1668C	PCB 119
GC/HRMS	EPA 1668A/1668C	PCB 120
GC/HRMS	EPA 1668A/1668C	PCB 121
GC/HRMS	EPA 1668A/1668C	PCB 122
GC/HRMS	EPA 1668A/1668C	PCB 123
GC/HRMS	EPA 1668A/1668C	PCB 124
GC/HRMS	EPA 1668A/1668C	PCB 125
GC/HRMS	EPA 1668A/1668C	PCB 126
GC/HRMS	EPA 1668A/1668C	PCB 127
GC/HRMS	EPA 1668A/1668C	PCB 128
GC/HRMS	EPA 1668A/1668C	PCB 129
GC/HRMS	EPA 1668A/1668C	PCB 130
GC/HRMS	EPA 1668A/1668C	PCB 131
GC/HRMS	EPA 1668A/1668C	PCB 132
GC/HRMS	EPA 1668A/1668C	PCB 133
GC/HRMS	EPA 1668A/1668C	PCB 134
GC/HRMS	EPA 1668A/1668C	PCB 135
GC/HRMS	EPA 1668A/1668C	PCB 136
GC/HRMS	EPA 1668A/1668C	PCB 137
GC/HRMS	EPA 1668A/1668C	PCB 138
GC/HRMS	EPA 1668A/1668C	PCB 139
GC/HRMS	EPA 1668A/1668C	PCB 140

Solid and Chemical Materials

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 141
GC/HRMS	EPA 1668A/1668C	PCB 142
GC/HRMS	EPA 1668A/1668C	PCB 143
GC/HRMS	EPA 1668A/1668C	PCB 144
GC/HRMS	EPA 1668A/1668C	PCB 145
GC/HRMS	EPA 1668A/1668C	PCB 146
GC/HRMS	EPA 1668A/1668C	PCB 147
GC/HRMS	EPA 1668A/1668C	PCB 148
GC/HRMS	EPA 1668A/1668C	PCB 149
GC/HRMS	EPA 1668A/1668C	PCB 150
GC/HRMS	EPA 1668A/1668C	PCB 151
GC/HRMS	EPA 1668A/1668C	PCB 152
GC/HRMS	EPA 1668A/1668C	PCB 153
GC/HRMS	EPA 1668A/1668C	PCB 154
GC/HRMS	EPA 1668A/1668C	PCB 155
GC/HRMS	EPA 1668A/1668C	PCB 156
GC/HRMS	EPA 1668A/1668C	PCB 157
GC/HRMS	EPA 1668A/1668C	PCB 158
GC/HRMS	EPA 1668A/1668C	PCB 159
GC/HRMS	EPA 1668A/1668C	PCB 160
GC/HRMS	EPA 1668A/1668C	PCB 161
GC/HRMS	EPA 1668A/1668C	PCB 162
GC/HRMS	EPA 1668A/1668C	PCB 163
GC/HRMS	EPA 1668A/1668C	PCB 164
GC/HRMS	EPA 1668A/1668C	PCB 165
GC/HRMS	EPA 1668A/1668C	PCB 166
GC/HRMS	EPA 1668A/1668C	PCB 167
GC/HRMS	EPA 1668A/1668C	PCB 168
GC/HRMS	EPA 1668A/1668C	PCB 169
GC/HRMS	EPA 1668A/1668C	PCB 170
GC/HRMS	EPA 1668A/1668C	PCB 171
GC/HRMS	EPA 1668A/1668C	PCB 172
GC/HRMS	EPA 1668A/1668C	PCB 173
GC/HRMS	EPA 1668A/1668C	PCB 174
GC/HRMS	EPA 1668A/1668C	PCB 175

Solid and Chemical Materials

Technology	Method	Analyte
GC/HRMS	EPA 1668A/1668C	PCB 176
GC/HRMS	EPA 1668A/1668C	PCB 177
GC/HRMS	EPA 1668A/1668C	PCB 178
GC/HRMS	EPA 1668A/1668C	PCB 179
GC/HRMS	EPA 1668A/1668C	PCB 180
GC/HRMS	EPA 1668A/1668C	PCB 181
GC/HRMS	EPA 1668A/1668C	PCB 182
GC/HRMS	EPA 1668A/1668C	PCB 183
GC/HRMS	EPA 1668A/1668C	PCB 184
GC/HRMS	EPA 1668A/1668C	PCB 185
GC/HRMS	EPA 1668A/1668C	PCB 186
GC/HRMS	EPA 1668A/1668C	PCB 187
GC/HRMS	EPA 1668A/1668C	PCB 188
GC/HRMS	EPA 1668A/1668C	PCB 189
GC/HRMS	EPA 1668A/1668C	PCB 190
GC/HRMS	EPA 1668A/1668C	PCB 191
GC/HRMS	EPA 1668A/1668C	PCB 192
GC/HRMS	EPA 1668A/1668C	PCB 193
GC/HRMS	EPA 1668A/1668C	PCB 194
GC/HRMS	EPA 1668A/1668C	PCB 195
GC/HRMS	EPA 1668A/1668C	PCB 196
GC/HRMS	EPA 1668A/1668C	PCB 197
GC/HRMS	EPA 1668A/1668C	PCB 198
GC/HRMS	EPA 1668A/1668C	PCB 199
GC/HRMS	EPA 1668A/1668C	PCB 200
GC/HRMS	EPA 1668A/1668C	PCB 201
GC/HRMS	EPA 1668A/1668C	PCB 202
GC/HRMS	EPA 1668A/1668C	PCB 203
GC/HRMS	EPA 1668A/1668C	PCB 204
GC/HRMS	EPA 1668A/1668C	PCB 205
GC/HRMS	EPA 1668A/1668C	PCB 206
GC/HRMS	EPA 1668A/1668C	PCB 207
GC/HRMS	EPA 1668A/1668C	PCB 208
GC/HRMS	EPA 1668A/1668C	PCB 209

Solid and Chemical Materials

Technology	Method	Analyte
Preparation	**Method**	**Type**
Acid Digestion (Aqueous)	EPA 3005A/3010A	Inorganics
Acid Digestion (Solid)	EPA 3050B	Inorganics
Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	Semivolatile and Non-Volatile Organics
Ultrasonic Extraction	EPA 3550B/3550C	Semivolatile and Non-Volatile Organics
Solvent Dilution	EPA 3580A	Semivolatile and Non-Volatile Organics
Purge and Trap	EPA 5030B	Volatile Organic Compounds
Purge and Trap	EPA 5035/5035A	Volatile Organic Compounds
Microwave Extraction	EPA 3546	Semivolatile and Non-Volatile Organics
Florisil Cleanup	EPA 3620B/3620C	Cleanup of pesticide residues and other chlorinated hydrocarbons
Sulfur Cleanup	EPA 3660A	Sulfur Cleanup
Sulfuric Acid Cleanup	EPA 3665A	Sulfuric Acid Cleanup for PCBs
Silica Gel Cleanup	EPA 3630C	Column Cleanup
TCLP Extraction	EPA 1311	Toxicity Characteristic Leaching Procedure
SPLP Extraction	EPA 1312	Synthetic Precipitation Leaching Procedure
STLC Extraction	CA-WET	California Waste Extraction Test

Air and Emissions

Technology	Method	Analyte
ICP-MS	EPA 6020/6020A	Aluminum
ICP-MS	EPA 6020/6020A	Antimony
ICP-MS	EPA 6020/6020A	Arsenic
ICP-MS	EPA 6020/6020A	Barium
ICP-MS	EPA 6020/6020A	Beryllium
ICP-MS	EPA 6020/6020A	Cadmium
ICP-MS	EPA 6020/6020A	Calcium
ICP-MS	EPA 6020/6020A	Chromium (Total)
ICP-MS	EPA 6020/6020A	Cobalt
ICP-MS	EPA 6020/6020A	Copper
ICP-MS	EPA 6020/6020A	Iron
ICP-MS	EPA 6020/6020A	Lead
ICP-MS	EPA 6020/6020A	Magnesium
ICP-MS	EPA 6020/6020A	Manganese

Air and Emissions

Technology	Method	Analyte
ICP-MS	EPA 6020/6020A	Molybdenum
ICP-MS	EPA 6020/6020A	Nickel
ICP-MS	EPA 6020/6020A	Potassium
ICP-MS	EPA 6020/6020A	Selenium
ICP-MS	EPA 6020/6020A	Silver
ICP-MS	EPA 6020/6020A	Sodium
ICP-MS	EPA 6020/6020A	Thallium
ICP-MS	EPA 6020/6020A	Vanadium
ICP-MS	EPA 6020/6020A	Zinc
Gravimetric	40CFR Part 50 App B	TSP (Total Suspended Particulate)
Gravimetric	40CFR Part 50 App J	PM10
GC/MS	EPA TO-13A	1,2,4-Trichlorobenzene
GC/MS	EPA TO-13A	1,2-Dichlorobenzene
GC/MS	EPA TO-13A	1,3-Dichlorobenzene
GC/MS	EPA TO-13A	1,4-Dichlorobenzene
GC/MS	EPA TO-13A	2,4,5-Trichlorophenol
GC/MS	EPA TO-13A	2,4,6-Trichlorophenol
GC/MS	EPA TO-13A	2,4-Dichlorophenol
GC/MS	EPA TO-13A	2,4-Dimethylphenol
GC/MS	EPA TO-13A	2,4-Dinitrophenol
GC/MS	EPA TO-13A	2,4-Dinitrotoluene
GC/MS	EPA TO-13A	2,6-Dinitrotoluene
GC/MS	EPA TO-13A	2-Chloronaphthalene
GC/MS	EPA TO-13A	2-Chlorophenol
GC/MS	EPA TO-13A	2-Methylnaphthalene
GC/MS	EPA TO-13A	2-Methylphenol
GC/MS	EPA TO-13A	2-Nitroaniline
GC/MS	EPA TO-13A	2-Nitrophenol
GC/MS	EPA TO-13A	3&4-Methylphenol
GC/MS	EPA TO-13A	3,3'-Dichlorobenzidine
GC/MS	EPA TO-13A	3-Nitroaniline
GC/MS	EPA TO-13A	4,6-Dinitro-2-methylphenol
GC/MS	EPA TO-13A	4-Bromophenyl phenyl ether
GC/MS	EPA TO-13A	4-Chloro-3-methylphenol
GC/MS	EPA TO-13A	4-Chloroaniline

Air and Emissions		
Technology	**Method**	**Analyte**
GC/MS	EPA TO-13A	4-Chlorophenyl phenyl ether
GC/MS	EPA TO-13A	4-Nitroaniline
GC/MS	EPA TO-13A	4-Nitrophenol
GC/MS	EPA TO-13A	Acenaphthene
GC/MS	EPA TO-13A	Acenaphthylene
GC/MS	EPA TO-13A	Aniline
GC/MS	EPA TO-13A	Anthracene
GC/MS	EPA TO-13A	Benzo(a)anthracene
GC/MS	EPA TO-13A	Benzo(a)pyrene
GC/MS	EPA TO-13A	Benzo(b)fluoranthene
GC/MS	EPA TO-13A	Benzo(g,h,i)perylene
GC/MS	EPA TO-13A	Benzo(k)fluoranthene
GC/MS	EPA TO-13A	Benzoic Acid
GC/MS	EPA TO-13A	Benzyl Alcohol
GC/MS	EPA TO-13A	Benzyl butyl Phthalate
GC/MS	EPA TO-13A	Biphenyl
GC/MS	EPA TO-13A	Bis(2-chloroethoxy) Methane
GC/MS	EPA TO-13A	Bis(2-chloroethyl) Ether
GC/MS	EPA TO-13A	Bis(2-chloroisopropyl) Ether
GC/MS	EPA TO-13A	Carbazole
GC/MS	EPA TO-13A	Chrysene
GC/MS	EPA TO-13A	Bis (2-ethylhexyl) Phthalate
GC/MS	EPA TO-13A	Dibenz(a,h)anthracene
GC/MS	EPA TO-13A	Dibenzofuran
GC/MS	EPA TO-13A	Diethyl Phthalate
GC/MS	EPA TO-13A	Dimethyl Phthalate
GC/MS	EPA TO-13A	Di-n-butyl Phthalate
GC/MS	EPA TO-13A	Di-n-octyl Phthalate
GC/MS	EPA TO-13A	Fluoranthene
GC/MS	EPA TO-13A	Fluorene
GC/MS	EPA TO-13A	Hexachlorobenzene
GC/MS	EPA TO-13A	Hexachlorobutadiene
GC/MS	EPA TO-13A	Hexachlorocyclopentadiene
GC/MS	EPA TO-13A	Hexachloroethane
GC/MS	EPA TO-13A	Indeno(1,2,3-c,d) Pyrene

Air and Emissions

Technology	Method	Analyte
GC/MS	EPA TO-13A	Isophorone
GC/MS	EPA TO-13A	Naphthalene
GC/MS	EPA TO-13A	Nitrobenzene
GC/MS	EPA TO-13A	n-Nitrosodimethylamine
GC/MS	EPA TO-13A	n-Nitrosodi-n-propylamine
GC/MS	EPA TO-13A	n-Nitrosodiphenylamine
GC/MS	EPA TO-13A	Pentachlorophenol
GC/MS	EPA TO-13A	Phenanthrene
GC/MS	EPA TO-13A	Phenol
GC/MS	EPA TO-13A	Pyrene
GC/MS SIM	EPA TO-13A SIM	1-Methylnaphthalene
GC/MS SIM	EPA TO-13A SIM	2-Methylnaphthalene
GC/MS SIM	EPA TO-13A SIM	Acenaphthene
GC/MS SIM	EPA TO-13A SIM	Acenaphthylene
GC/MS SIM	EPA TO-13A SIM	Anthracene
GC/MS SIM	EPA TO-13A SIM	Benzo(a)anthracene
GC/MS SIM	EPA TO-13A SIM	Benzo(a)pyrene
GC/MS SIM	EPA TO-13A SIM	Benzo(b)fluoranthene
GC/MS SIM	EPA TO-13A SIM	Benzo(g,h,i)perylene
GC/MS SIM	EPA TO-13A SIM	Benzo(k)fluoranthene
GC/MS SIM	EPA TO-13A SIM	Chrysene
GC/MS SIM	EPA TO-13A SIM	Fluoranthene
GC/MS SIM	EPA TO-13A SIM	Fluorene
GC/MS SIM	EPA TO-13A SIM	Indeno(1,2,3-c,d) Pyrene
GC/MS SIM	EPA TO-13A SIM	Naphthalene
GC/MS SIM	EPA TO-13A SIM	Phenanthrene
GC/MS SIM	EPA TO-13A SIM	Pyrene
GC-ECD	EPA TO-4A/TO-10A	PCB-1016
GC-ECD	EPA TO-4A/TO-10A	PCB-1221
GC-ECD	EPA TO-4A/TO-10A	PCB-1232
GC-ECD	EPA TO-4A/TO-10A	PCB-1242
GC-ECD	EPA TO-4A/TO-10A	PCB-1248
GC-ECD	EPA TO-4A/TO-10A	PCB-1254
GC-ECD	EPA TO-4A/TO-10A	PCB-1260
GC-ECD	EPA TO-4A/TO-10A	PCB-1262

Air and Emissions		
Technology	**Method**	**Analyte**
GC-ECD	EPA TO-4A/TO-10A	PCB-1268
Preparation	**Method**	**Type**
Acid Digestion (Filters, Solid)	EPA 3050B	Inorganics
Soxhlet extraction of PUF	TO-4A/TO-10A	PCBs in Air
Soxhlet extraction of PUF/XAD	TO-13	Semivolatiles in Air
Florisil Cleanup	EPA 3620B/3620C	Cleanup of pesticide residues and other chlorinated hydrocarbons
Sulfur Cleanup	EPA 3660A	Sulfur Cleanup
Sulfuric Acid Cleanup	EPA 3665A	Sulfuric Acid Cleanup for PCBs

Biological Tissue		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methyl perfluorooctanesulfon amidoacetic acid (MeFOSAA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctanoic acid (PFOA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorobutyric acid (PFBA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropentanoic acid (PFPA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroheptanoic acid (PFHpA)

Biological Tissue

Technology	Method	Analyte
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorononanoic acid (PFNA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorodecanoic acid (PFDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroundecanoic acid (PFUDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctane Sulfonamide (FOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)

Biological Tissue		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	10:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorododecane sulfonic acid) (10:2 FTS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorohexadecanoic acid (PFHxDA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoropentane Sulfonic acid (PFPS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorononane Sulfonic acid (PFNS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoro-2-propoxypropionic acid (GenX Parent Acid) (HFPO-DA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorododecanesulfonic acid (PFDoS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorooctadecanoic acid (PFODA)

Biological Tissue		
Technology	**Method**	**Analyte**
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethylperfluorooctane sulfonamide (EtFOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methylperfluorooctane sulfonamide (MeFOSA)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Perfluorodecane Sulfonic Acid (PFDS)
LC/MS/MS	Draft EPA Method 1633	6:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorooctane sulfonic acid) (6:2 FTS)
LC/MS/MS	Draft EPA Method 1633	8:2 Fluorotelomer sulfonic acid (1H,1H,2H,2H-perfluorodecane sulfonic acid) (8:2 FTS)
LC/MS/MS	Draft EPA Method 1633	N-Ethyl perfluorooctanesulfon amidoacetic acid (EtFOSAA)
LC/MS/MS	Draft EPA Method 1633	N-Methyl perfluorooctanesulfon amidoacetic acid (MeFOSAA)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctanoic acid (PFOA)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctane Sulfonic Acid (PFOS)
LC/MS/MS	Draft EPA Method 1633	Perfluorobutyric acid (PFBA)
LC/MS/MS	Draft EPA Method 1633	Perfluoropentanoic acid (PFPA)
LC/MS/MS	Draft EPA Method 1633	Perfluorohexanoic acid (PFHxA)
LC/MS/MS	Draft EPA Method 1633	Perfluoroheptanoic acid (PFHpA)

Biological Tissue

Technology	Method	Analyte
LC/MS/MS	Draft EPA Method 1633	Perfluorononanoic acid (PFNA)
LC/MS/MS	Draft EPA Method 1633	Perfluorodecanoic acid (PFDA)
LC/MS/MS	Draft EPA Method 1633	Perfluoroundecanoic acid (PFUDA)
LC/MS/MS	Draft EPA Method 1633	Perfluorododecanoic acid (PFDoDA)
LC/MS/MS	Draft EPA Method 1633	Perfluorotridecanoic acid (PFTriA)
LC/MS/MS	Draft EPA Method 1633	Perfluorotetradecanoic acid (PDTeA)
LC/MS/MS	Draft EPA Method 1633	Perfluorobutane Sulfonic Acid (PFBS)
LC/MS/MS	Draft EPA Method 1633	Perfluorohexane Sulfonic Acid (PFHxS)
LC/MS/MS	Draft EPA Method 1633	Perfluorooctane Sulfonamide (FOSA)
LC/MS/MS	Draft EPA Method 1633	4:2 Fluorotelomer sulfonic acid (1H, 1H,2H,2H-perfluorohexane sulfonic acid) (4:2 FTS)
LC/MS/MS	Draft EPA Method 1633	Perfluoropentane Sulfonic acid (PFPS)
LC/MS/MS	Draft EPA Method 1633	Perfluorononane Sulfonic acid (PFNS)
LC/MS/MS	Draft EPA Method 1633	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-2-propoxypropionic acid (GenX Parent Acid) (HFPO-DA)
LC/MS/MS	Draft EPA Method 1633	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)
LC/MS/MS	Draft EPA Method 1633	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11C1-PF3OUdS)
LC/MS/MS	Draft EPA Method 1633	Perfluorododecanesulfonic acid (PFDoS)
LC/MS/MS	Draft EPA Method 1633	N-Ethylperfluorooctane sulfonamide (EtFOSA)
LC/MS/MS	Draft EPA Method 1633	N-Methylperfluorooctane sulfonamide (MeFOSA)
LC/MS/MS	Draft EPA Method 1633	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)
LC/MS/MS	Draft EPA Method 1633	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)
LC/MS/MS	Draft EPA Method 1633	Perfluoroheptane Sulfonic Acid (PFHpS)
LC/MS/MS	Draft EPA Method 1633	Perfluorodecane Sulfonic Acid (PFDS)
LC/MS/MS	Draft EPA Method 1633	4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-3-methoxypropanoic acid (PFMPA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro-4-methoxybutanoic acid (PFMBA)

Biological Tissue		
Technology	**Method**	**Analyte**
LC/MS/MS	Draft EPA Method 1633	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)
LC/MS/MS	Draft EPA Method 1633	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)
Preparation	**Method**	**Type**
Tissue Extraction for PFAS	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 WS-LC-0025	Sonication/Solvent Shake with SPE cleanup

Note:

1. This scope is formatted as part of a single document including Certificate of Accreditation No. L2468.

R. Douglas Leonard Jr., VP, PILR SBU

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 488 • Manchester, WA 98353-0488 • (360) 871-8840

April 29, 2022

Lisa Stafford
Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Dear Lisa Stafford:

Thank you for your application for renewal in the Environmental Laboratory Accreditation Program. Attached is a Certificate of Accreditation covering the one-year period beginning May 6, 2022 and a current Scope of Accreditation.

Accreditation is based in part on third party recognition of the Labs ORELAP accreditation.

Alkalinity by SM 2320 B-2011 in Non-Potable Water has been placed into Good Standing from Interim Accreditation in recognition of your ORELAP scope of accreditation.

The following parameters were returned to Good Standing in recognition of your ORELAP scope of accreditation:

- Perfluorodecane sulfonate (PFDS) by SOP WS-LC-0025 in Non-Potable Water
- Perfluorodecane sulfonate (PFDS) by SOP WS-LC-0025 in Solid and Chemical Materials

The following parameters are Denied because they are not present on the labs ORELAP scope of accreditation:

- Nitrate by EPA 353.2_2_1993 in Non-Potable Water
- 1,2-Dibromo-3-chloropropane (DBCP) by EPA 8260C_(8/06) in Solid and Chemical Materials

1,4-Dioxane by EPA 8260C_(8/06) in Solid and Chemical Materials has been Denied because no PTs were reported for this parameter in the previous accreditation year when two approved providers are available. Two acceptable PTs for this parameter are required before your next renewal to return the parameter to Good Standing.

Renewal of accreditation is based in part on review of your lab's performance over the past year as evidenced by participation in proficiency testing (PT) studies. In general, full accreditation is awarded for those parameters for which the two most recent PT results, if applicable, were rated satisfactory. Provisional accreditation is awarded if the latest of the two most recent PT results was rated "Not Acceptable" or only one PT result was submitted during the past twelve months. Accreditation is withheld for those parameters for which the two most recent PT results were rated "Not Acceptable" or no PT results were submitted during the past twelve-months.

As a reminder, continued participation in the Ecology Lab Accreditation Program requires the lab to:

- Submit a renewal application and fees annually
- Report significant changes in facility, personnel, analytical methods, equipment, the lab's quality assurance (QA) manual or QA procedures as they occur
- **Participate in proficiency testing studies semi-annually, with the following exception: For each parameter where all PT results were satisfactory, you are required to submit only one PT result over this next year, and in subsequent years, as long as the results are satisfactory.**
- Submit copies of current third-party Scopes of Accreditation when they are available.

YOUR RIGHT TO APPEAL

You have a right to appeal Ecology's decision to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this decision letter. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this decision:

- File your appeal and a copy of this decision with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this decision on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

If you have any questions concerning the accreditation of your lab, please contact Ryan Zboralski at (360) 871-8845, fax (360) 871-8849, or by e-mail at ryan.zboralski@ecy.wa.gov.

Sincerely,

Rebecca Wood
Lab Accreditation Unit Supervisor

RW:ERZ:erz
Enclosures

The State of Washington
Department of Ecology

Eurofins Sacramento

West Sacramento, CA

has complied with provisions set forth in Chapter 173-50 WAC and is hereby recognized by the Department of Ecology as an ACCREDITED LABORATORY for the analytical parameters listed on the accompanying Scope of Accreditation.

This certificate is effective May 6, 2022 and shall expire May 5, 2023.

Witnessed under my hand on April 29, 2022.

Rebecca Wood

Rebecca Wood
Lab Accreditation Unit Supervisor

Laboratory ID
C581

WASHINGTON STATE DEPARTMENT OF ECOLOGY

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

SCOPE OF ACCREDITATION

Eurofins Sacramento

West Sacramento, CA

is accredited for the analytes listed below using the methods indicated. Full accreditation is granted unless stated otherwise in a note. EPA is the U.S. Environmental Protection Agency. SM is "Standard Methods for the Examination of Water and Wastewater." SM refers to EPA approved method versions. ASTM is the American Society for Testing and Materials. USGS is the U.S. Geological Survey. AOAC is the Association of Official Analytical Chemists. Other references are described in notes.

Matrix/Analyte	Method	Notes
Drinking Water		
Perchlorate	EPA 331.0_1.0_2005	1
2,3,7,8-TCDD	EPA 1613B_1994	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	EPA 537.1_(11/18)	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	EPA 537.1_(11/18)	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	EPA 537.1_(11/18)	1
Hexafluoropropylene oxide dimer acid (HFPO-DA)	EPA 537.1_(11/18)	1
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 537.1_(11/18)	1
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 537.1_(11/18)	1
Perfluorobutane sulfonic acid (PFBS)	EPA 537.1_(11/18)	1
Perfluorodecanoic acid (PFDA)	EPA 537.1_(11/18)	1
Perfluorododecanoic acid (PFDoA)	EPA 537.1_(11/18)	1
Perfluoroheptanoic acid (PFHpA)	EPA 537.1_(11/18)	1
Perfluorohexane sulfonic acid (PFHxS)	EPA 537.1_(11/18)	1
Perfluorohexanoic acid (PFHxA)	EPA 537.1_(11/18)	1
Perfluorononanoic acid (PFNA)	EPA 537.1_(11/18)	1
Perfluorooctane sulfonic acid (PFOS)	EPA 537.1_(11/18)	1
Perfluorooctanoic acid (PFOA)	EPA 537.1_(11/18)	1
Perfluorotetradecanoic acid (PFTeDA)	EPA 537.1_(11/18)	1
Perfluorotridecanoic acid (PFTrDA)	EPA 537.1_(11/18)	1
Perfluoroundecanoic acid (PFUnA)	EPA 537.1_(11/18)	1
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 537_1.1_2009	1
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 537_1.1_2009	1
Perfluorodecanoic acid (PFDA)	EPA 537_1.1_2009	1
Perfluorododecanoic acid (PFDoA)	EPA 537_1.1_2009	1
Perfluoroheptanoic acid (PFHpA)	EPA 537_1.1_2009	1
Perfluorohexanoic acid (PFHxA)	EPA 537_1.1_2009	1

Matrix/Analyte	Method	Notes
Drinking Water		
Perfluorononanoic acid (PFNA)	EPA 537_1.1_2009	1
Perfluorooctanoic acid (PFOA)	EPA 537_1.1_2009	1
Perfluorotetradecanoic acid (PFTeDA)	EPA 537_1.1_2009	1
Perfluorotridecanoic acid (PFTrDA)	EPA 537_1.1_2009	1
Perfluoroundecanoic acid (PFUnA)	EPA 537_1.1_2009	1
Non-Potable Water		
Bromide	EPA 300.0_2.1_1993	1
Chloride	EPA 300.0_2.1_1993	1
Fluoride	EPA 300.0_2.1_1993	1
Nitrate	EPA 300.0_2.1_1993	1
Nitrite	EPA 300.0_2.1_1993	1
Orthophosphate	EPA 300.0_2.1_1993	1
Sulfate	EPA 300.0_2.1_1993	1
Nitrate + Nitrite	EPA 353.2_2_1993	1
Nitrite	EPA 353.2_2_1993	1
Alkalinity	SM 2320 B-2011	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613B_1994	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613B_1994	1
1,2,3,4,6,7,8-Hpcdd	EPA 1613B_1994	1
1,2,3,4,6,7,8-Hpcdf	EPA 1613B_1994	1
1,2,3,4,7,8,9-Hpcdf	EPA 1613B_1994	1
1,2,3,4,7,8-Hxcdd	EPA 1613B_1994	1
1,2,3,4,7,8-Hxcdf	EPA 1613B_1994	1
1,2,3,6,7,8-Hxcdd	EPA 1613B_1994	1
1,2,3,6,7,8-Hxcdf	EPA 1613B_1994	1
1,2,3,7,8,9-Hxcdd	EPA 1613B_1994	1
1,2,3,7,8,9-Hxcdf	EPA 1613B_1994	1
1,2,3,7,8-Pecdd	EPA 1613B_1994	1
1,2,3,7,8-Pecdf	EPA 1613B_1994	1
2,3,4,6,7,8-Hxcdf	EPA 1613B_1994	1
2,3,4,7,8-Pecdf	EPA 1613B_1994	1
2,3,7,8-TCDD	EPA 1613B_1994	1
2,3,7,8-TCDF	EPA 1613B_1994	1
Hpcdd, total	EPA 1613B_1994	1
Hpcdf, total	EPA 1613B_1994	1
Hxcdd, total	EPA 1613B_1994	1
Hxcdf, total	EPA 1613B_1994	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Pecdd, total	EPA 1613B_1994	1
Pecdf, total	EPA 1613B_1994	1
TCDD, total	EPA 1613B_1994	1
TCDF, total	EPA 1613B_1994	1
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	EPA 1668C_2010	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)	EPA 1668C_2010	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	EPA 1668C_2010	1
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)	EPA 1668C_2010	1
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)	EPA 1668C_2010	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)	EPA 1668C_2010	1
2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)	EPA 1668C_2010	1
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)	EPA 1668C_2010	1
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)	EPA 1668C_2010	1
2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)	EPA 1668C_2010	1
2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)	EPA 1668C_2010	1
2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)	EPA 1668C_2010	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)	EPA 1668C_2010	1
2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)	EPA 1668C_2010	1
2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)	EPA 1668C_2010	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)	EPA 1668C_2010	1
2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)	EPA 1668C_2010	1
2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)	EPA 1668C_2010	1
2,2',3,3',4-Pentachlorobiphenyl (BZ-82)	EPA 1668C_2010	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)	EPA 1668C_2010	1
2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)	EPA 1668C_2010	1
2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)	EPA 1668C_2010	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)	EPA 1668C_2010	1
2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)	EPA 1668C_2010	1
2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)	EPA 1668C_2010	1
2,2',3,3',5-Pentachlorobiphenyl (BZ-83)	EPA 1668C_2010	1
2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,2',3,3',6-Pentachlorobiphenyl (BZ-84)	EPA 1668C_2010	1
2,2',3,3'-Tetrachlorobiphenyl (BZ-40)	EPA 1668C_2010	1
2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)	EPA 1668C_2010	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	EPA 1668C_2010	1
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)	EPA 1668C_2010	1
2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)	EPA 1668C_2010	1
2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)	EPA 1668C_2010	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	EPA 1668C_2010	1
2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)	EPA 1668C_2010	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	EPA 1668C_2010	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)	EPA 1668C_2010	1
2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)	EPA 1668C_2010	1
2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)	EPA 1668C_2010	1
2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)	EPA 1668C_2010	1
2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)	EPA 1668C_2010	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	EPA 1668C_2010	1
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	EPA 1668C_2010	1
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)	EPA 1668C_2010	1
2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)	EPA 1668C_2010	1
2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)	EPA 1668C_2010	1
2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)	EPA 1668C_2010	1
2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)	EPA 1668C_2010	1
2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)	EPA 1668C_2010	1
2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)	EPA 1668C_2010	1
2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)	EPA 1668C_2010	1
2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)	EPA 1668C_2010	1
2,2',3,4,5-Pentachlorobiphenyl (BZ-86)	EPA 1668C_2010	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	EPA 1668C_2010	1
2,2',3,4',5-Pentachlorobiphenyl (BZ-90)	EPA 1668C_2010	1
2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)	EPA 1668C_2010	1
2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)	EPA 1668C_2010	1
2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)	EPA 1668C_2010	1
2,2',3,4,6-Pentachlorobiphenyl (BZ-88)	EPA 1668C_2010	1
2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)	EPA 1668C_2010	1
2,2',3,4',6-Pentachlorobiphenyl (BZ-91)	EPA 1668C_2010	1
2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)	EPA 1668C_2010	1
2,2',3,4-Tetrachlorobiphenyl (BZ-41)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,2',3,4'-Tetrachlorobiphenyl (BZ-42)	EPA 1668C_2010	1
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	EPA 1668C_2010	1
2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)	EPA 1668C_2010	1
2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)	EPA 1668C_2010	1
2,2',3,5,6-Pentachlorobiphenyl (BZ-93)	EPA 1668C_2010	1
2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)	EPA 1668C_2010	1
2,2',3,5',6-Pentachlorobiphenyl (BZ-95)	EPA 1668C_2010	1
2,2',3,5-Tetrachlorobiphenyl (BZ-43)	EPA 1668C_2010	1
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	EPA 1668C_2010	1
2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)	EPA 1668C_2010	1
2,2',3,6-Tetrachlorobiphenyl (BZ-45)	EPA 1668C_2010	1
2,2',3,6'-Tetrachlorobiphenyl (BZ-46)	EPA 1668C_2010	1
2,2',3-Trichlorobiphenyl (BZ-16)	EPA 1668C_2010	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	EPA 1668C_2010	1
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)	EPA 1668C_2010	1
2,2',4,4',5-Pentachlorobiphenyl (BZ-99)	EPA 1668C_2010	1
2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)	EPA 1668C_2010	1
2,2',4,4',6-Pentachlorobiphenyl (BZ-100)	EPA 1668C_2010	1
2,2',4,4'-Tetrachlorobiphenyl (BZ-47)	EPA 1668C_2010	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	EPA 1668C_2010	1
2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)	EPA 1668C_2010	1
2,2',4,5',6-Pentachlorobiphenyl (BZ-103)	EPA 1668C_2010	1
2,2',4,5-Tetrachlorobiphenyl (BZ-48)	EPA 1668C_2010	1
2,2',4,5'-Tetrachlorobiphenyl (BZ-49)	EPA 1668C_2010	1
2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)	EPA 1668C_2010	1
2,2',4,6-Tetrachlorobiphenyl (BZ-50)	EPA 1668C_2010	1
2,2',4,6'-Tetrachlorobiphenyl (BZ-51)	EPA 1668C_2010	1
2,2',4-Trichlorobiphenyl (BZ-17)	EPA 1668C_2010	1
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	EPA 1668C_2010	1
2,2',5,6'-Tetrachlorobiphenyl (BZ-53)	EPA 1668C_2010	1
2,2',5-Trichlorobiphenyl (BZ-18)	EPA 1668C_2010	1
2,2',6,6'-Tetrachlorobiphenyl (BZ-54)	EPA 1668C_2010	1
2,2',6-Trichlorobiphenyl (BZ-19)	EPA 1668C_2010	1
2,2'-Dichlorobiphenyl (BZ-4)	EPA 1668C_2010	1
2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)	EPA 1668C_2010	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)	EPA 1668C_2010	1
2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)	EPA 1668C_2010	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)	EPA 1668C_2010	1
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)	EPA 1668C_2010	1
2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)	EPA 1668C_2010	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)	EPA 1668C_2010	1
2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)	EPA 1668C_2010	1
2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)	EPA 1668C_2010	1
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	EPA 1668C_2010	1
2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)	EPA 1668C_2010	1
2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)	EPA 1668C_2010	1
2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)	EPA 1668C_2010	1
2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)	EPA 1668C_2010	1
2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)	EPA 1668C_2010	1
2,3,3',4,5-Pentachlorobiphenyl (BZ-106)	EPA 1668C_2010	1
2,3,3',4',5-Pentachlorobiphenyl (BZ-107)	EPA 1668C_2010	1
2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)	EPA 1668C_2010	1
2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)	EPA 1668C_2010	1
2,3,3',4,6-Pentachlorobiphenyl (BZ-109)	EPA 1668C_2010	1
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	EPA 1668C_2010	1
2,3,3',4-Tetrachlorobiphenyl (BZ-55)	EPA 1668C_2010	1
2,3,3',4'-Tetrachlorobiphenyl (BZ-56)	EPA 1668C_2010	1
2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)	EPA 1668C_2010	1
2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)	EPA 1668C_2010	1
2,3,3',5,6-Pentachlorobiphenyl (BZ-112)	EPA 1668C_2010	1
2,3,3',5',6-Pentachlorobiphenyl (BZ-113)	EPA 1668C_2010	1
2,3,3',5-Tetrachlorobiphenyl (BZ-57)	EPA 1668C_2010	1
2,3,3',5'-Tetrachlorobiphenyl (BZ-58)	EPA 1668C_2010	1
2,3,3',6-Tetrachlorobiphenyl (BZ-59)	EPA 1668C_2010	1
2,3,3'-Trichlorobiphenyl (BZ-20)	EPA 1668C_2010	1
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)	EPA 1668C_2010	1
2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)	EPA 1668C_2010	1
2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)	EPA 1668C_2010	1
2,3,4,4',5-Pentachlorobiphenyl (BZ-114)	EPA 1668C_2010	1
2,3',4,4',5-Pentachlorobiphenyl (BZ-118)	EPA 1668C_2010	1
2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)	EPA 1668C_2010	1
2,3,4,4',6-Pentachlorobiphenyl (BZ-115)	EPA 1668C_2010	1
2,3',4,4',6-Pentachlorobiphenyl (BZ-119)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,3,4,4'-Tetrachlorobiphenyl (BZ-60)	EPA 1668C_2010	1
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	EPA 1668C_2010	1
2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)	EPA 1668C_2010	1
2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)	EPA 1668C_2010	1
2,3,4,5,6-Pentachlorobiphenyl (BZ-116)	EPA 1668C_2010	1
2,3,4',5,6-Pentachlorobiphenyl (BZ-117)	EPA 1668C_2010	1
2,3',4,5',6-Pentachlorobiphenyl (BZ-121)	EPA 1668C_2010	1
2,3',4',5',6-Pentachlorobiphenyl (BZ-125)	EPA 1668C_2010	1
2,3,4,5-Tetrachlorobiphenyl (BZ-61)	EPA 1668C_2010	1
2,3,4',5-Tetrachlorobiphenyl (BZ-63)	EPA 1668C_2010	1
2,3',4,5'-Tetrachlorobiphenyl (BZ-68)	EPA 1668C_2010	1
2,3',4',5-Tetrachlorobiphenyl (BZ-70)	EPA 1668C_2010	1
2,3',4',5'-Tetrachlorobiphenyl (BZ-76)	EPA 1668C_2010	1
2,3',4,5-Tetrachlorobiphenyl (BZ-67)	EPA 1668C_2010	1
2,3,4,6-Tetrachlorobiphenyl (BZ-62)	EPA 1668C_2010	1
2,3,4',6-Tetrachlorobiphenyl (BZ-64)	EPA 1668C_2010	1
2,3',4,6-Tetrachlorobiphenyl (BZ-69)	EPA 1668C_2010	1
2,3',4',6-Tetrachlorobiphenyl (BZ-71)	EPA 1668C_2010	1
2,3,4-Trichlorobiphenyl (BZ-21)	EPA 1668C_2010	1
2,3,4'-Trichlorobiphenyl (BZ-22)	EPA 1668C_2010	1
2,3',4-Trichlorobiphenyl (BZ-25)	EPA 1668C_2010	1
2,3',4'-Trichlorobiphenyl (BZ-33)	EPA 1668C_2010	1
2,3',5,5'-Tetrachlorobiphenyl (BZ-72)	EPA 1668C_2010	1
2,3,5,6-Tetrachlorobiphenyl (BZ-65)	EPA 1668C_2010	1
2,3',5',6-Tetrachlorobiphenyl (BZ-73)	EPA 1668C_2010	1
2,3,5-Trichlorobiphenyl (BZ-23)	EPA 1668C_2010	1
2,3',5-Trichlorobiphenyl (BZ-26)	EPA 1668C_2010	1
2,3',5'-Trichlorobiphenyl (BZ-34)	EPA 1668C_2010	1
2,3,6-Trichlorobiphenyl (BZ-24)	EPA 1668C_2010	1
2,3',6-Trichlorobiphenyl (BZ-27)	EPA 1668C_2010	1
2,3-Dichlorobiphenyl (BZ-5)	EPA 1668C_2010	1
2,3'-Dichlorobiphenyl (BZ-6)	EPA 1668C_2010	1
2,4,4',5-Tetrachlorobiphenyl (BZ-74)	EPA 1668C_2010	1
2,4,4',6-Tetrachlorobiphenyl (BZ-75)	EPA 1668C_2010	1
2,4,4'-Trichlorobiphenyl (BZ-28)	EPA 1668C_2010	1
2,4,5-Trichlorobiphenyl (BZ-29)	EPA 1668C_2010	1
2,4',5-Trichlorobiphenyl (BZ-31)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,4,6-Trichlorobiphenyl (BZ-30)	EPA 1668C_2010	1
2,4',6-Trichlorobiphenyl (BZ-32)	EPA 1668C_2010	1
2,4-Dichlorobiphenyl (BZ-7)	EPA 1668C_2010	1
2,4'-Dichlorobiphenyl (BZ-8)	EPA 1668C_2010	1
2,5-Dichlorobiphenyl (BZ-9)	EPA 1668C_2010	1
2,6-Dichlorobiphenyl (BZ-10)	EPA 1668C_2010	1
2-Chlorobiphenyl (BZ-1)	EPA 1668C_2010	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)	EPA 1668C_2010	1
3,3',4,4',5-Pentachlorobiphenyl (BZ-126)	EPA 1668C_2010	1
3,3',4,4'-Tetrachlorobiphenyl (BZ-77)	EPA 1668C_2010	1
3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)	EPA 1668C_2010	1
3,3',4,5-Tetrachlorobiphenyl (BZ-78)	EPA 1668C_2010	1
3,3',4,5'-Tetrachlorobiphenyl (BZ-79)	EPA 1668C_2010	1
3,3',4-Trichlorobiphenyl (BZ-35)	EPA 1668C_2010	1
3,3',5,5'-Tetrachlorobiphenyl (BZ-80)	EPA 1668C_2010	1
3,3',5-Trichlorobiphenyl (BZ-36)	EPA 1668C_2010	1
3,3'-Dichlorobiphenyl (BZ-11)	EPA 1668C_2010	1
3,4,4',5-Tetrachlorobiphenyl (BZ-81)	EPA 1668C_2010	1
3,4,4'-Trichlorobiphenyl (BZ-37)	EPA 1668C_2010	1
3,4,5-Trichlorobiphenyl (BZ-38)	EPA 1668C_2010	1
3,4',5-Trichlorobiphenyl (BZ-39)	EPA 1668C_2010	1
3,4-Dichlorobiphenyl (BZ-12)	EPA 1668C_2010	1
3,4'-Dichlorobiphenyl (BZ-13)	EPA 1668C_2010	1
3,5-Dichlorobiphenyl (BZ-14)	EPA 1668C_2010	1
3-Chlorobiphenyl (BZ-2)	EPA 1668C_2010	1
4,4'-Dichlorobiphenyl (BZ-15)	EPA 1668C_2010	1
4-Chlorobiphenyl (BZ-3)	EPA 1668C_2010	1
Coelution - Dichlorobiphenyls (BZ-12-+13)	EPA 1668C_2010	1
Coelution - Heptachlorobiphenyls (BZ-171 + BZ-173)	EPA 1668C_2010	1
Coelution - Heptachlorobiphenyls (BZ-180 + BZ-193)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-128 + BZ-166)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-129 + BZ138 + BZ-163)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-135 + BZ-151)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-139 + BZ-140)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-147 + BZ-149)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-153 + BZ-168)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-156 + BZ-157)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Coelution - Octachlorobiphenyls (BZ-198 + BZ-199)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-107 + BZ-124)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-110 + BZ-115)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-88 + BZ-91)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-93 + BZ-100)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-98 + BZ-102)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-40 + BZ-71)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-49 + BZ-69)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-50 + BZ-53)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-18 + BZ-30)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-20 + BZ-28)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-21 + BZ-33)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-26 + BZ-29)	EPA 1668C_2010	1
Decachlorobiphenyl (BZ-209)	EPA 1668C_2010	1
Total Dichlorobiphenyls	EPA 1668C_2010	1
Total Heptachlorobiphenyls	EPA 1668C_2010	1
Total Hexachlorobiphenyls	EPA 1668C_2010	1
Total Monochlorobiphenyls	EPA 1668C_2010	1
Total Nonachlorobiphenyls	EPA 1668C_2010	1
Total Octachlorobiphenyls	EPA 1668C_2010	1
Total Pentachlorobiphenyls	EPA 1668C_2010	1
Total Tetrachlorobiphenyls	EPA 1668C_2010	1
Total Trichlorobiphenyls	EPA 1668C_2010	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H,-Perfluorodecanesulfonic acid (8:2 FTS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H,-Perfluorooctansulfonic acid (6:2 FTS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2-FTS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	SOP WS-LC-0025	1,3
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	SOP WS-LC-0025	1,3
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	SOP WS-LC-0025	1,3
Hexafluoropropylene oxide dimer acid (HFPO-DA)	SOP WS-LC-0025	1,3

Matrix/Analyte	Method	Notes
Non-Potable Water		
N-Ethylperfluorooctane sulfonamide (EtFOSA)	SOP WS-LC-0025	1,3
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	SOP WS-LC-0025	1,3
N-Ethylperfluorooctanesulfonamidoethanol (EtFOSE)	SOP WS-LC-0025	1,3
N-Methylperfluorooctane sulfonamide (MeFOSA)	SOP WS-LC-0025	1,3
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	SOP WS-LC-0025	1,3
N-Methylperfluorooctanesulfonamidoethanol (MeFOSE)	SOP WS-LC-0025	1,3
Perfluorobutane sulfonic acid (PFBS)	SOP WS-LC-0025	1,3
Perfluorobutanoic acid (PFBA)	SOP WS-LC-0025	1,3
Perfluorodecane sulfonate (PFDS)	SOP WS-LC-0025	1,3
Perfluorodecane sulfonic acid (PFDS)	SOP WS-LC-0025	1,3
Perfluorodecanoic acid (PFDA)	SOP WS-LC-0025	1,3
Perfluorododecane sulfonic acid (PFDoS)	SOP WS-LC-0025	1,3
Perfluorododecanoic acid (PFDoA)	SOP WS-LC-0025	1,3
Perfluoroheptane sulfonic acid (PFHpS)	SOP WS-LC-0025	1,3
Perfluoroheptanoic acid (PFHpA)	SOP WS-LC-0025	1,3
Perfluorohexane sulfonic acid (PFHxS)	SOP WS-LC-0025	1,3
Perfluorohexanoic acid (PFHxA)	SOP WS-LC-0025	1,3
Perfluorononane sulfonic acid (PFNS)	SOP WS-LC-0025	1,3
Perfluorononanoic acid (PFNA)	SOP WS-LC-0025	1,3
Perfluorooctane sulfonamide (PFOSA)	SOP WS-LC-0025	1,3
Perfluorooctane sulfonic acid (PFOS)	SOP WS-LC-0025	1,3
Perfluorooctanoic acid (PFOA)	SOP WS-LC-0025	1,3
Perfluoropentane sulfonic acid (PFPeS)	SOP WS-LC-0025	1,3
Perfluoropentanoic acid (PFPeA)	SOP WS-LC-0025	1,3
Perfluorotetradecanoic acid (PFTeDA)	SOP WS-LC-0025	1,3
Perfluorotridecanoic acid (PFTrDA)	SOP WS-LC-0025	1,3
Perfluoroundecanoic acid (PFUnA)	SOP WS-LC-0025	1,3
Solid and Chemical Materials		
Perchlorate	EPA 6850-07	1
Chromium, Hexavalent	EPA 7196A_1_1992	1,2
Aluminum	EPA 6010C_(2/07)	1
Antimony	EPA 6010C_(2/07)	1
Arsenic	EPA 6010C_(2/07)	1
Barium	EPA 6010C_(2/07)	1
Beryllium	EPA 6010C_(2/07)	1
Cadmium	EPA 6010C_(2/07)	1
Calcium	EPA 6010C_(2/07)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Chromium	EPA 6010C_(2/07)	1
Cobalt	EPA 6010C_(2/07)	1
Copper	EPA 6010C_(2/07)	1
Iron	EPA 6010C_(2/07)	1
Lead	EPA 6010C_(2/07)	1
Magnesium	EPA 6010C_(2/07)	1
Manganese	EPA 6010C_(2/07)	1
Molybdenum	EPA 6010C_(2/07)	1
Nickel	EPA 6010C_(2/07)	1
Potassium	EPA 6010C_(2/07)	1
Selenium	EPA 6010C_(2/07)	1
Silver	EPA 6010C_(2/07)	1
Sodium	EPA 6010C_(2/07)	1
Thallium	EPA 6010C_(2/07)	1
Vanadium	EPA 6010C_(2/07)	1
Zinc	EPA 6010C_(2/07)	1
Antimony	EPA 6020A_(2/07)	1
Arsenic	EPA 6020A_(2/07)	1
Barium	EPA 6020A_(2/07)	1
Beryllium	EPA 6020A_(2/07)	1
Cadmium	EPA 6020A_(2/07)	1
Chromium	EPA 6020A_(2/07)	1
Cobalt	EPA 6020A_(2/07)	1
Copper	EPA 6020A_(2/07)	1
Iron	EPA 6020A_(2/07)	1
Lead	EPA 6020A_(2/07)	1
Molybdenum	EPA 6020A_(2/07)	1
Nickel	EPA 6020A_(2/07)	1
Selenium	EPA 6020A_(2/07)	1
Silver	EPA 6020A_(2/07)	1
Thallium	EPA 6020A_(2/07)	1
Vanadium	EPA 6020A_(2/07)	1
Zinc	EPA 6020A_(2/07)	1
Mercury	EPA 7470A_1_1994	1,2
Mercury	EPA 7471B_(2/07)	1
4,4'-DDD	EPA 8081B_(2/07)	1
4,4'-DDE	EPA 8081B_(2/07)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
4,4'-DDT	EPA 8081B_(2/07)	1
Aldrin	EPA 8081B_(2/07)	1
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081B_(2/07)	1
alpha-Chlordane	EPA 8081B_(2/07)	1
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081B_(2/07)	1
Chlordane (tech.)	EPA 8081B_(2/07)	1
Chlorobenzilate	EPA 8081B_(2/07)	1
delta-BHC	EPA 8081B_(2/07)	1
Diallate	EPA 8081B_(2/07)	1
Dieldrin	EPA 8081B_(2/07)	1
Endosulfan I	EPA 8081B_(2/07)	1
Endosulfan II	EPA 8081B_(2/07)	1
Endosulfan sulfate	EPA 8081B_(2/07)	1
Endrin	EPA 8081B_(2/07)	1
Endrin aldehyde	EPA 8081B_(2/07)	1
Endrin ketone	EPA 8081B_(2/07)	1
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081B_(2/07)	1
gamma-Chlordane	EPA 8081B_(2/07)	1
Heptachlor	EPA 8081B_(2/07)	1
Heptachlor epoxide	EPA 8081B_(2/07)	1
Isodrin	EPA 8081B_(2/07)	1
Methoxychlor	EPA 8081B_(2/07)	1
Toxaphene (Chlorinated camphene)	EPA 8081B_(2/07)	1
Aroclor-1016 (PCB-1016)	EPA 8082A_(2/07)	1
Aroclor-1221 (PCB-1221)	EPA 8082A_(2/07)	1
Aroclor-1232 (PCB-1232)	EPA 8082A_(2/07)	1
Aroclor-1242 (PCB-1242)	EPA 8082A_(2/07)	1
Aroclor-1248 (PCB-1248)	EPA 8082A_(2/07)	1
Aroclor-1254 (PCB-1254)	EPA 8082A_(2/07)	1
Aroclor-1260 (PCB-1260)	EPA 8082A_(2/07)	1
Aroclor-1262 (PCB-1262)	EPA 8082A_(2/07)	1
Aroclor-1268 (PCB-1268)	EPA 8082A_(2/07)	1
Nitrocellulose	SOP WS-WC-0050	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613B_1994	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613B_1994	1
1,2,3,4,6,7,8-Hpcdd	EPA 1613B_1994	1
1,2,3,4,6,7,8-Hpcdf	EPA 1613B_1994	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
1,2,3,4,7,8,9-Hpcdf	EPA 1613B_1994	1
1,2,3,4,7,8-Hxcdd	EPA 1613B_1994	1
1,2,3,4,7,8-Hxcdf	EPA 1613B_1994	1
1,2,3,6,7,8-Hxcdd	EPA 1613B_1994	1
1,2,3,6,7,8-Hxcdf	EPA 1613B_1994	1
1,2,3,7,8,9-Hxcdd	EPA 1613B_1994	1
1,2,3,7,8,9-Hxcdf	EPA 1613B_1994	1
1,2,3,7,8-Pecdd	EPA 1613B_1994	1
1,2,3,7,8-Pecdf	EPA 1613B_1994	1
2,3,4,6,7,8-Hxcdf	EPA 1613B_1994	1
2,3,4,7,8-Pecdf	EPA 1613B_1994	1
2,3,7,8-TCDD	EPA 1613B_1994	1
2,3,7,8-TCDF	EPA 1613B_1994	1
Hpcdd, total	EPA 1613B_1994	1
Hpcdf, total	EPA 1613B_1994	1
Hxcdd, total	EPA 1613B_1994	1
Hxcdf, total	EPA 1613B_1994	1
Pecdd, total	EPA 1613B_1994	1
Pecdf, total	EPA 1613B_1994	1
TCDD, total	EPA 1613B_1994	1
TCDF, total	EPA 1613B_1994	1
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	EPA 1668C_2010	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)	EPA 1668C_2010	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	EPA 1668C_2010	1
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)	EPA 1668C_2010	1
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)	EPA 1668C_2010	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)	EPA 1668C_2010	1
2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)	EPA 1668C_2010	1
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)	EPA 1668C_2010	1
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)	EPA 1668C_2010	1
2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)	EPA 1668C_2010	1
2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)	EPA 1668C_2010	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)	EPA 1668C_2010	1
2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)	EPA 1668C_2010	1
2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)	EPA 1668C_2010	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)	EPA 1668C_2010	1
2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)	EPA 1668C_2010	1
2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)	EPA 1668C_2010	1
2,2',3,3',4-Pentachlorobiphenyl (BZ-82)	EPA 1668C_2010	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)	EPA 1668C_2010	1
2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)	EPA 1668C_2010	1
2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)	EPA 1668C_2010	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)	EPA 1668C_2010	1
2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)	EPA 1668C_2010	1
2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)	EPA 1668C_2010	1
2,2',3,3',5-Pentachlorobiphenyl (BZ-83)	EPA 1668C_2010	1
2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)	EPA 1668C_2010	1
2,2',3,3',6-Pentachlorobiphenyl (BZ-84)	EPA 1668C_2010	1
2,2',3,3'-Tetrachlorobiphenyl (BZ-40)	EPA 1668C_2010	1
2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)	EPA 1668C_2010	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	EPA 1668C_2010	1
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)	EPA 1668C_2010	1
2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)	EPA 1668C_2010	1
2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)	EPA 1668C_2010	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	EPA 1668C_2010	1
2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)	EPA 1668C_2010	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	EPA 1668C_2010	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)	EPA 1668C_2010	1
2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)	EPA 1668C_2010	1
2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)	EPA 1668C_2010	1
2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)	EPA 1668C_2010	1
2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)	EPA 1668C_2010	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	EPA 1668C_2010	1
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	EPA 1668C_2010	1
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)	EPA 1668C_2010	1
2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)	EPA 1668C_2010	1
2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)	EPA 1668C_2010	1
2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)	EPA 1668C_2010	1
2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)	EPA 1668C_2010	1
2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)	EPA 1668C_2010	1
2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)	EPA 1668C_2010	1
2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)	EPA 1668C_2010	1
2,2',3,4,5-Pentachlorobiphenyl (BZ-86)	EPA 1668C_2010	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	EPA 1668C_2010	1
2,2',3,4',5-Pentachlorobiphenyl (BZ-90)	EPA 1668C_2010	1
2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)	EPA 1668C_2010	1
2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)	EPA 1668C_2010	1
2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)	EPA 1668C_2010	1
2,2',3,4,6-Pentachlorobiphenyl (BZ-88)	EPA 1668C_2010	1
2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)	EPA 1668C_2010	1
2,2',3,4',6-Pentachlorobiphenyl (BZ-91)	EPA 1668C_2010	1
2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)	EPA 1668C_2010	1
2,2',3,4-Tetrachlorobiphenyl (BZ-41)	EPA 1668C_2010	1
2,2',3,4'-Tetrachlorobiphenyl (BZ-42)	EPA 1668C_2010	1
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	EPA 1668C_2010	1
2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)	EPA 1668C_2010	1
2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)	EPA 1668C_2010	1
2,2',3,5,6-Pentachlorobiphenyl (BZ-93)	EPA 1668C_2010	1
2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)	EPA 1668C_2010	1
2,2',3,5',6-Pentachlorobiphenyl (BZ-95)	EPA 1668C_2010	1
2,2',3,5-Tetrachlorobiphenyl (BZ-43)	EPA 1668C_2010	1
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	EPA 1668C_2010	1
2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)	EPA 1668C_2010	1
2,2',3,6-Tetrachlorobiphenyl (BZ-45)	EPA 1668C_2010	1
2,2',3,6'-Tetrachlorobiphenyl (BZ-46)	EPA 1668C_2010	1
2,2',3-Trichlorobiphenyl (BZ-16)	EPA 1668C_2010	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	EPA 1668C_2010	1
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)	EPA 1668C_2010	1
2,2',4,4',5-Pentachlorobiphenyl (BZ-99)	EPA 1668C_2010	1
2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)	EPA 1668C_2010	1
2,2',4,4',6-Pentachlorobiphenyl (BZ-100)	EPA 1668C_2010	1
2,2',4,4'-Tetrachlorobiphenyl (BZ-47)	EPA 1668C_2010	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)	EPA 1668C_2010	1
2,2',4,5',6-Pentachlorobiphenyl (BZ-103)	EPA 1668C_2010	1
2,2',4,5-Tetrachlorobiphenyl (BZ-48)	EPA 1668C_2010	1
2,2',4,5'-Tetrachlorobiphenyl (BZ-49)	EPA 1668C_2010	1
2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)	EPA 1668C_2010	1
2,2',4,6-Tetrachlorobiphenyl (BZ-50)	EPA 1668C_2010	1
2,2',4,6'-Tetrachlorobiphenyl (BZ-51)	EPA 1668C_2010	1
2,2',4-Trichlorobiphenyl (BZ-17)	EPA 1668C_2010	1
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	EPA 1668C_2010	1
2,2',5,6'-Tetrachlorobiphenyl (BZ-53)	EPA 1668C_2010	1
2,2',5-Trichlorobiphenyl (BZ-18)	EPA 1668C_2010	1
2,2',6,6'-Tetrachlorobiphenyl (BZ-54)	EPA 1668C_2010	1
2,2',6-Trichlorobiphenyl (BZ-19)	EPA 1668C_2010	1
2,2'-Dichlorobiphenyl (BZ-4)	EPA 1668C_2010	1
2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)	EPA 1668C_2010	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)	EPA 1668C_2010	1
2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)	EPA 1668C_2010	1
2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)	EPA 1668C_2010	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)	EPA 1668C_2010	1
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)	EPA 1668C_2010	1
2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)	EPA 1668C_2010	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)	EPA 1668C_2010	1
2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)	EPA 1668C_2010	1
2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)	EPA 1668C_2010	1
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	EPA 1668C_2010	1
2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)	EPA 1668C_2010	1
2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)	EPA 1668C_2010	1
2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)	EPA 1668C_2010	1
2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)	EPA 1668C_2010	1
2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)	EPA 1668C_2010	1
2,3,3',4,5-Pentachlorobiphenyl (BZ-106)	EPA 1668C_2010	1
2,3,3',4',5-Pentachlorobiphenyl (BZ-107)	EPA 1668C_2010	1
2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)	EPA 1668C_2010	1
2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)	EPA 1668C_2010	1
2,3,3',4,6-Pentachlorobiphenyl (BZ-109)	EPA 1668C_2010	1
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	EPA 1668C_2010	1
2,3,3',4-Tetrachlorobiphenyl (BZ-55)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,3,3',4'-Tetrachlorobiphenyl (BZ-56)	EPA 1668C_2010	1
2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)	EPA 1668C_2010	1
2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)	EPA 1668C_2010	1
2,3,3',5,6-Pentachlorobiphenyl (BZ-112)	EPA 1668C_2010	1
2,3,3',5',6-Pentachlorobiphenyl (BZ-113)	EPA 1668C_2010	1
2,3,3',5-Tetrachlorobiphenyl (BZ-57)	EPA 1668C_2010	1
2,3,3',5'-Tetrachlorobiphenyl (BZ-58)	EPA 1668C_2010	1
2,3,3',6-Tetrachlorobiphenyl (BZ-59)	EPA 1668C_2010	1
2,3,3'-Trichlorobiphenyl (BZ-20)	EPA 1668C_2010	1
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)	EPA 1668C_2010	1
2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)	EPA 1668C_2010	1
2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)	EPA 1668C_2010	1
2,3,4,4',5-Pentachlorobiphenyl (BZ-114)	EPA 1668C_2010	1
2,3',4,4',5-Pentachlorobiphenyl (BZ-118)	EPA 1668C_2010	1
2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)	EPA 1668C_2010	1
2,3,4,4',6-Pentachlorobiphenyl (BZ-115)	EPA 1668C_2010	1
2,3',4,4',6-Pentachlorobiphenyl (BZ-119)	EPA 1668C_2010	1
2,3,4,4'-Tetrachlorobiphenyl (BZ-60)	EPA 1668C_2010	1
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	EPA 1668C_2010	1
2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)	EPA 1668C_2010	1
2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)	EPA 1668C_2010	1
2,3,4,5,6-Pentachlorobiphenyl (BZ-116)	EPA 1668C_2010	1
2,3,4',5,6-Pentachlorobiphenyl (BZ-117)	EPA 1668C_2010	1
2,3',4,5',6-Pentachlorobiphenyl (BZ-121)	EPA 1668C_2010	1
2,3',4',5',6-Pentachlorobiphenyl (BZ-125)	EPA 1668C_2010	1
2,3,4,5-Tetrachlorobiphenyl (BZ-61)	EPA 1668C_2010	1
2,3,4',5-Tetrachlorobiphenyl (BZ-63)	EPA 1668C_2010	1
2,3',4,5'-Tetrachlorobiphenyl (BZ-68)	EPA 1668C_2010	1
2,3',4',5-Tetrachlorobiphenyl (BZ-70)	EPA 1668C_2010	1
2,3',4',5'-Tetrachlorobiphenyl (BZ-76)	EPA 1668C_2010	1
2,3',4,5-Tetrachlorobiphenyl (BZ-67)	EPA 1668C_2010	1
2,3,4,6-Tetrachlorobiphenyl (BZ-62)	EPA 1668C_2010	1
2,3,4',6-Tetrachlorobiphenyl (BZ-64)	EPA 1668C_2010	1
2,3',4,6-Tetrachlorobiphenyl (BZ-69)	EPA 1668C_2010	1
2,3',4',6-Tetrachlorobiphenyl (BZ-71)	EPA 1668C_2010	1
2,3,4-Trichlorobiphenyl (BZ-21)	EPA 1668C_2010	1
2,3,4'-Trichlorobiphenyl (BZ-22)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,3',4-Trichlorobiphenyl (BZ-25)	EPA 1668C_2010	1
2,3',4'-Trichlorobiphenyl (BZ-33)	EPA 1668C_2010	1
2,3',5,5'-Tetrachlorobiphenyl (BZ-72)	EPA 1668C_2010	1
2,3,5,6-Tetrachlorobiphenyl (BZ-65)	EPA 1668C_2010	1
2,3',5',6-Tetrachlorobiphenyl (BZ-73)	EPA 1668C_2010	1
2,3,5-Trichlorobiphenyl (BZ-23)	EPA 1668C_2010	1
2,3',5-Trichlorobiphenyl (BZ-26)	EPA 1668C_2010	1
2,3',5'-Trichlorobiphenyl (BZ-34)	EPA 1668C_2010	1
2,3,6-Trichlorobiphenyl (BZ-24)	EPA 1668C_2010	1
2,3',6-Trichlorobiphenyl (BZ-27)	EPA 1668C_2010	1
2,3-Dichlorobiphenyl (BZ-5)	EPA 1668C_2010	1
2,3'-Dichlorobiphenyl (BZ-6)	EPA 1668C_2010	1
2,4,4',5-Tetrachlorobiphenyl (BZ-74)	EPA 1668C_2010	1
2,4,4',6-Tetrachlorobiphenyl (BZ-75)	EPA 1668C_2010	1
2,4,4'-Trichlorobiphenyl (BZ-28)	EPA 1668C_2010	1
2,4,5-Trichlorobiphenyl (BZ-29)	EPA 1668C_2010	1
2,4',5-Trichlorobiphenyl (BZ-31)	EPA 1668C_2010	1
2,4,6-Trichlorobiphenyl (BZ-30)	EPA 1668C_2010	1
2,4',6-Trichlorobiphenyl (BZ-32)	EPA 1668C_2010	1
2,4-Dichlorobiphenyl (BZ-7)	EPA 1668C_2010	1
2,4'-Dichlorobiphenyl (BZ-8)	EPA 1668C_2010	1
2,5-Dichlorobiphenyl (BZ-9)	EPA 1668C_2010	1
2,6-Dichlorobiphenyl (BZ-10)	EPA 1668C_2010	1
2-Chlorobiphenyl (BZ-1)	EPA 1668C_2010	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)	EPA 1668C_2010	1
3,3',4,4',5-Pentachlorobiphenyl (BZ-126)	EPA 1668C_2010	1
3,3',4,4'-Tetrachlorobiphenyl (BZ-77)	EPA 1668C_2010	1
3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)	EPA 1668C_2010	1
3,3',4,5-Tetrachlorobiphenyl (BZ-78)	EPA 1668C_2010	1
3,3',4,5'-Tetrachlorobiphenyl (BZ-79)	EPA 1668C_2010	1
3,3',4-Trichlorobiphenyl (BZ-35)	EPA 1668C_2010	1,
3,3',5,5'-Tetrachlorobiphenyl (BZ-80)	EPA 1668C_2010	1
3,3',5-Trichlorobiphenyl (BZ-36)	EPA 1668C_2010	1
3,3'-Dichlorobiphenyl (BZ-11)	EPA 1668C_2010	1
3,4,4',5-Tetrachlorobiphenyl (BZ-81)	EPA 1668C_2010	1
3,4,4'-Trichlorobiphenyl (BZ-37)	EPA 1668C_2010	1
3,4,5-Trichlorobiphenyl (BZ-38)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
3,4',5-Trichlorobiphenyl (BZ-39)	EPA 1668C_2010	1
3,4-Dichlorobiphenyl (BZ-12)	EPA 1668C_2010	1
3,4'-Dichlorobiphenyl (BZ-13)	EPA 1668C_2010	1
3,5-Dichlorobiphenyl (BZ-14)	EPA 1668C_2010	1
3-Chlorobiphenyl (BZ-2)	EPA 1668C_2010	1
4,4'-Dichlorobiphenyl (BZ-15)	EPA 1668C_2010	1
4-Chlorobiphenyl (BZ-3)	EPA 1668C_2010	1
Coelution - Dichlorobiphenyls (BZ-12-+13)	EPA 1668C_2010	1
Coelution - Heptachlorobiphenyls (BZ-171 + BZ-173)	EPA 1668C_2010	1
Coelution - Heptachlorobiphenyls (BZ-180 + BZ-193)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-128 + BZ-166)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-129 + BZ138 + BZ-163)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-135 + BZ-151)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-139 + BZ-140)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-147 + BZ-149)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-153 + BZ-168)	EPA 1668C_2010	1
Coelution - Hexachlorobiphenyls (BZ-156 + BZ-157)	EPA 1668C_2010	1
Coelution - Octachlorobiphenyls (BZ-198 + BZ-199)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-107 + BZ-124)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-110 + BZ-115)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-88 + BZ-91)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-93 + BZ-100)	EPA 1668C_2010	1
Coelution - Pentachlorobiphenyls (BZ-98 + BZ-102)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-40 + BZ-71)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-49 + BZ-69)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-50 + BZ-53)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)	EPA 1668C_2010	1
Coelution - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-18 + BZ-30)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-20 + BZ-28)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-21 + BZ-33)	EPA 1668C_2010	1
Coelution - Trichlorobiphenyls (BZ-26 + BZ-29)	EPA 1668C_2010	1
Decachlorobiphenyl (BZ-209)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Total Dichlorobiphenyls	EPA 1668C_2010	1
Total Heptachlorobiphenyls	EPA 1668C_2010	1
Total Hexachlorobiphenyls	EPA 1668C_2010	1
Total Monochlorobiphenyls	EPA 1668C_2010	1
Total Nonachlorobiphenyls	EPA 1668C_2010	1
Total Octachlorobiphenyls	EPA 1668C_2010	1
Total Pentachlorobiphenyls	EPA 1668C_2010	1
Total Tetrachlorobiphenyls	EPA 1668C_2010	1
Total Trichlorobiphenyls	EPA 1668C_2010	1
1,1,1,2-Tetrachloroethane	EPA 8260C_(8/06)	1
1,1,1-Trichloroethane	EPA 8260C_(8/06)	1
1,1,2,2-Tetrachloroethane	EPA 8260C_(8/06)	1
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA 8260C_(8/06)	1
1,1,2-Trichloroethane	EPA 8260C_(8/06)	1
1,1-Dichloroethane	EPA 8260C_(8/06)	1
1,1-Dichloroethylene	EPA 8260C_(8/06)	1
1,1-Dichloropropene	EPA 8260C_(8/06)	1
1,2,3-Trichlorobenzene	EPA 8260C_(8/06)	1
1,2,3-Trichloropropane	EPA 8260C_(8/06)	1
1,2,4-Trichlorobenzene	EPA 8260C_(8/06)	1
1,2,4-Trimethylbenzene	EPA 8260C_(8/06)	1
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260C_(8/06)	1
1,2-Dichlorobenzene	EPA 8260C_(8/06)	1
1,2-Dichloroethane (Ethylene dichloride)	EPA 8260C_(8/06)	1
1,2-Dichloropropane	EPA 8260C_(8/06)	1
1,3,5-Trimethylbenzene	EPA 8260C_(8/06)	1
1,3-Dichlorobenzene	EPA 8260C_(8/06)	1
1,3-Dichloropropane	EPA 8260C_(8/06)	1
1,4-Dichlorobenzene	EPA 8260C_(8/06)	1
1-Chlorohexane	EPA 8260C_(8/06)	1
2,2-Dichloropropane	EPA 8260C_(8/06)	1
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260C_(8/06)	1
2-Chloroethyl vinyl ether	EPA 8260C_(8/06)	1
2-Chlorotoluene	EPA 8260C_(8/06)	1
2-Hexanone	EPA 8260C_(8/06)	1
4-Chlorotoluene	EPA 8260C_(8/06)	1
4-Isopropyltoluene (p-Cymene)	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
4-Methyl-2-pentanone (MIBK)	EPA 8260C_(8/06)	1
Acetone	EPA 8260C_(8/06)	1
Acrolein (Propenal)	EPA 8260C_(8/06)	1
Acrylonitrile	EPA 8260C_(8/06)	1
Allyl chloride (3-Chloropropene)	EPA 8260C_(8/06)	1
Benzene	EPA 8260C_(8/06)	1
Bromobenzene	EPA 8260C_(8/06)	1
Bromochloromethane	EPA 8260C_(8/06)	1
Bromodichloromethane	EPA 8260C_(8/06)	1
Bromoform	EPA 8260C_(8/06)	1
Carbon disulfide	EPA 8260C_(8/06)	1
Carbon tetrachloride	EPA 8260C_(8/06)	1
Chlorobenzene	EPA 8260C_(8/06)	1
Chlorodibromomethane	EPA 8260C_(8/06)	1
Chloroethane (Ethyl chloride)	EPA 8260C_(8/06)	1
Chloroform	EPA 8260C_(8/06)	1
Chloroprene (2-Chloro-1,3-butadiene)	EPA 8260C_(8/06)	1
cis & trans-1,2-Dichloroethene	EPA 8260C_(8/06)	1
cis-1,2-Dichloroethylene	EPA 8260C_(8/06)	1
cis-1,3-Dichloropropene	EPA 8260C_(8/06)	1
Dibromomethane	EPA 8260C_(8/06)	1
Dichlorodifluoromethane (Freon-12)	EPA 8260C_(8/06)	1
Ethyl methacrylate	EPA 8260C_(8/06)	1
Ethylbenzene	EPA 8260C_(8/06)	1
Hexachlorobutadiene	EPA 8260C_(8/06)	1
Iodomethane (Methyl iodide)	EPA 8260C_(8/06)	1
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260C_(8/06)	1
Isopropylbenzene	EPA 8260C_(8/06)	1
m+p-xylene	EPA 8260C_(8/06)	1
Methacrylonitrile	EPA 8260C_(8/06)	1
Methyl bromide (Bromomethane)	EPA 8260C_(8/06)	1
Methyl chloride (Chloromethane)	EPA 8260C_(8/06)	1
Methyl tert-butyl ether (MTBE)	EPA 8260C_(8/06)	1
Methylene chloride (Dichloromethane)	EPA 8260C_(8/06)	1
Naphthalene	EPA 8260C_(8/06)	1
n-Butylbenzene	EPA 8260C_(8/06)	1
n-Hexane	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
n-Propylbenzene	EPA 8260C_(8/06)	1
o-Xylene	EPA 8260C_(8/06)	1
Propionitrile (Ethyl cyanide)	EPA 8260C_(8/06)	1
sec-Butylbenzene	EPA 8260C_(8/06)	1
Styrene	EPA 8260C_(8/06)	1
tert-amylmethylether (TAME)	EPA 8260C_(8/06)	1
tert-Butyl alcohol	EPA 8260C_(8/06)	1
tert-Butylbenzene	EPA 8260C_(8/06)	1
Tetrachloroethylene (Perchloroethylene)	EPA 8260C_(8/06)	1
Toluene	EPA 8260C_(8/06)	1
trans-1,2-Dichloroethylene	EPA 8260C_(8/06)	1
trans-1,3-Dichloropropylene	EPA 8260C_(8/06)	1
trans-1,4-Dichloro-2-butene	EPA 8260C_(8/06)	1
Trichloroethene (Trichloroethylene)	EPA 8260C_(8/06)	1
Trichlorofluoromethane (Freon 11)	EPA 8260C_(8/06)	1
Vinyl acetate	EPA 8260C_(8/06)	1
Vinyl chloride	EPA 8260C_(8/06)	1
Xylene (total)	EPA 8260C_(8/06)	1
1,2,4,5-Tetrachlorobenzene	EPA 8270D_5_(7/14)	1
1,2,4-Trichlorobenzene	EPA 8270D_5_(7/14)	1
1,2-Dichlorobenzene	EPA 8270D_5_(7/14)	1
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270D_5_(7/14)	1
1,3-Dichlorobenzene	EPA 8270D_5_(7/14)	1
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270D_5_(7/14)	1
1,4-Dichlorobenzene	EPA 8270D_5_(7/14)	1
1,4-Dinitrobenzene	EPA 8270D_5_(7/14)	1
1,4-Naphthoquinone	EPA 8270D_5_(7/14)	1
1,4-Phenylenediamine	EPA 8270D_5_(7/14)	1
1-Chloronaphthalene	EPA 8270D_5_(7/14)	1
1-Methylnaphthalene	EPA 8270D_5_(7/14)	1
1-Naphthylamine	EPA 8270D_5_(7/14)	1
2,2'-Oxybis(1-chloropropane)	EPA 8270D_5_(7/14)	1
2,3,4,6-Tetrachlorophenol	EPA 8270D_5_(7/14)	1
2,4,5-Trichlorophenol	EPA 8270D_5_(7/14)	1
2,4,6-Trichlorophenol	EPA 8270D_5_(7/14)	1
2,4-Dichlorophenol	EPA 8270D_5_(7/14)	1
2,4-Dimethylphenol	EPA 8270D_5_(7/14)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,4-Dinitrophenol	EPA 8270D_5_(7/14)	1
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270D_5_(7/14)	1
2,6-Dichlorophenol	EPA 8270D_5_(7/14)	1
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270D_5_(7/14)	1
2-Acetylaminofluorene	EPA 8270D_5_(7/14)	1
2-Chloronaphthalene	EPA 8270D_5_(7/14)	1
2-Chlorophenol	EPA 8270D_5_(7/14)	1
2-Methylaniline (o-Toluidine)	EPA 8270D_5_(7/14)	1
2-Methylnaphthalene	EPA 8270D_5_(7/14)	1
2-Methylphenol (o-Cresol)	EPA 8270D_5_(7/14)	1
2-Naphthylamine	EPA 8270D_5_(7/14)	1
2-Nitroaniline	EPA 8270D_5_(7/14)	1
2-Nitrophenol	EPA 8270D_5_(7/14)	1
2-Picoline (2-Methylpyridine)	EPA 8270D_5_(7/14)	1
3,3'-Dichlorobenzidine	EPA 8270D_5_(7/14)	1
3,3'-Dimethylbenzidine	EPA 8270D_5_(7/14)	1
3-Methylcholanthrene	EPA 8270D_5_(7/14)	1
3-Methylphenol (m-Cresol)	EPA 8270D_5_(7/14)	1
3-Nitroaniline	EPA 8270D_5_(7/14)	1
4,6-Dinitro-2-methylphenol	EPA 8270D_5_(7/14)	1
4-Aminobiphenyl	EPA 8270D_5_(7/14)	1
4-Bromophenyl phenyl ether (BDE-3)	EPA 8270D_5_(7/14)	1
4-Chloro-3-methylphenol	EPA 8270D_5_(7/14)	1
4-Chloroaniline	EPA 8270D_5_(7/14)	1
4-Chlorophenyl phenylether	EPA 8270D_5_(7/14)	1
4-Dimethyl aminoazobenzene	EPA 8270D_5_(7/14)	1
4-Methylphenol (p-Cresol)	EPA 8270D_5_(7/14)	1
4-Nitroaniline	EPA 8270D_5_(7/14)	1
4-Nitrophenol	EPA 8270D_5_(7/14)	1
5-Nitro-o-toluidine	EPA 8270D_5_(7/14)	1
7,12-Dimethylbenz(a) anthracene	EPA 8270D_5_(7/14)	1
a,a-Dimethylphenethylamine	EPA 8270D_5_(7/14)	1
Acenaphthene	EPA 8270D_5_(7/14)	1
Acenaphthylene	EPA 8270D_5_(7/14)	1
Acetophenone	EPA 8270D_5_(7/14)	1
Aniline	EPA 8270D_5_(7/14)	1
Anthracene	EPA 8270D_5_(7/14)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Aramite	EPA 8270D_5_(7/14)	1
Benzidine	EPA 8270D_5_(7/14)	1
Benzo(a)anthracene	EPA 8270D_5_(7/14)	1
Benzo(a)pyrene	EPA 8270D_5_(7/14)	1
Benzo(g,h,i)perylene	EPA 8270D_5_(7/14)	1
Benzo(k)fluoranthene	EPA 8270D_5_(7/14)	1
Benzo[b]fluoranthene	EPA 8270D_5_(7/14)	1
Benzoic acid	EPA 8270D_5_(7/14)	1
Benzyl alcohol	EPA 8270D_5_(7/14)	1
bis(2-Chloroethoxy)methane	EPA 8270D_5_(7/14)	1
bis(2-Chloroethyl) ether	EPA 8270D_5_(7/14)	1
Butyl benzyl phthalate	EPA 8270D_5_(7/14)	1
Carbazole	EPA 8270D_5_(7/14)	1
Chlorobenzilate	EPA 8270D_5_(7/14)	1
Chrysene	EPA 8270D_5_(7/14)	1
Di(2-ethylhexyl)phthalate	EPA 8270D_5_(7/14)	1
Diallate	EPA 8270D_5_(7/14)	1
Dibenz(a,h) anthracene	EPA 8270D_5_(7/14)	1
Dibenz(a,j) acridine	EPA 8270D_5_(7/14)	1
Dibenzofuran	EPA 8270D_5_(7/14)	1
Diethyl phthalate	EPA 8270D_5_(7/14)	1
Dimethoate	EPA 8270D_5_(7/14)	1
Dimethyl phthalate	EPA 8270D_5_(7/14)	1
Di-n-butyl phthalate	EPA 8270D_5_(7/14)	1
Di-n-octyl phthalate	EPA 8270D_5_(7/14)	1
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270D_5_(7/14)	1
Diphenylamine	EPA 8270D_5_(7/14)	1
Disulfoton	EPA 8270D_5_(7/14)	1
Ethyl methanesulfonate	EPA 8270D_5_(7/14)	1
Famphur	EPA 8270D_5_(7/14)	1
Fluoranthene	EPA 8270D_5_(7/14)	1
Fluorene	EPA 8270D_5_(7/14)	1
Hexachlorobenzene	EPA 8270D_5_(7/14)	1
Hexachlorobutadiene	EPA 8270D_5_(7/14)	1
Hexachlorocyclopentadiene	EPA 8270D_5_(7/14)	1
Hexachloroethane	EPA 8270D_5_(7/14)	1
Hexachloropropene	EPA 8270D_5_(7/14)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Indeno(1,2,3-cd) pyrene	EPA 8270D_5_(7/14)	1
Isodrin	EPA 8270D_5_(7/14)	1
Isophorone	EPA 8270D_5_(7/14)	1
Isosafrole	EPA 8270D_5_(7/14)	1
Kepone	EPA 8270D_5_(7/14)	1
Methapyrilene	EPA 8270D_5_(7/14)	1
Methyl methanesulfonate	EPA 8270D_5_(7/14)	1
Methyl parathion (Parathion, methyl)	EPA 8270D_5_(7/14)	1
Naphthalene	EPA 8270D_5_(7/14)	1
Nitrobenzene	EPA 8270D_5_(7/14)	1
N-Nitrosodiethylamine	EPA 8270D_5_(7/14)	1
N-Nitrosodimethylamine	EPA 8270D_5_(7/14)	1
N-Nitroso-di-n-butylamine	EPA 8270D_5_(7/14)	1
N-Nitroso-di-n-propylamine	EPA 8270D_5_(7/14)	1
N-Nitrosopiperidine	EPA 8270D_5_(7/14)	1
N-Nitrosopyrrolidine	EPA 8270D_5_(7/14)	1
o,o,o-Triethyl phosphorothioate	EPA 8270D_5_(7/14)	1
Parathion, ethyl	EPA 8270D_5_(7/14)	1
Pentachlorobenzene	EPA 8270D_5_(7/14)	1
Pentachloronitrobenzene	EPA 8270D_5_(7/14)	1
Pentachlorophenol	EPA 8270D_5_(7/14)	1
Phenacetin	EPA 8270D_5_(7/14)	1
Phenanthrene	EPA 8270D_5_(7/14)	1
Phenol	EPA 8270D_5_(7/14)	1
Phorate	EPA 8270D_5_(7/14)	1
Pronamide (Kerb)	EPA 8270D_5_(7/14)	1
Pyrene	EPA 8270D_5_(7/14)	1
Pyridine	EPA 8270D_5_(7/14)	1
Safrole	EPA 8270D_5_(7/14)	1
Thionazin (Zinophos)	EPA 8270D_5_(7/14)	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8280B_2_(2/07)	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8280B_2_(2/07)	1
1,2,3,4,6,7,8-Hpcdd	EPA 8280B_2_(2/07)	1
1,2,3,4,6,7,8-Hpcdf	EPA 8280B_2_(2/07)	1
1,2,3,4,7,8,9-Hpcdf	EPA 8280B_2_(2/07)	1
1,2,3,4,7,8-Hxcdd	EPA 8280B_2_(2/07)	1
1,2,3,4,7,8-Hxcdf	EPA 8280B_2_(2/07)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
1,2,3,6,7,8-Hxcdd	EPA 8280B_2_(2/07)	1
1,2,3,6,7,8-Hxcdf	EPA 8280B_2_(2/07)	1
1,2,3,7,8,9-Hxcdd	EPA 8280B_2_(2/07)	1
1,2,3,7,8,9-Hxcdf	EPA 8280B_2_(2/07)	1
1,2,3,7,8-Pecdd	EPA 8280B_2_(2/07)	1
1,2,3,7,8-Pecdf	EPA 8280B_2_(2/07)	1
2,3,4,6,7,8-Hxcdf	EPA 8280B_2_(2/07)	1
2,3,4,7,8-Pecdf	EPA 8280B_2_(2/07)	1
2,3,7,8-TCDD	EPA 8280B_2_(2/07)	1
2,3,7,8-TCDF	EPA 8280B_2_(2/07)	1
Hpcdd, total	EPA 8280B_2_(2/07)	1
Hpcdf, total	EPA 8280B_2_(2/07)	1
Hxcdd, total	EPA 8280B_2_(2/07)	1
Hxcdf, total	EPA 8280B_2_(2/07)	1
Pecdd, total	EPA 8280B_2_(2/07)	1
Pecdf, total	EPA 8280B_2_(2/07)	1
TCDD, total	EPA 8280B_2_(2/07)	1
TCDF, total	EPA 8280B_2_(2/07)	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8290A_1_(2/07)	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290A_1_(2/07)	1
1,2,3,4,6,7,8-Hpcdd	EPA 8290A_1_(2/07)	1
1,2,3,4,6,7,8-Hpcdf	EPA 8290A_1_(2/07)	1
1,2,3,4,7,8,9-Hpcdf	EPA 8290A_1_(2/07)	1
1,2,3,4,7,8-Hxcdd	EPA 8290A_1_(2/07)	1
1,2,3,4,7,8-Hxcdf	EPA 8290A_1_(2/07)	1
1,2,3,6,7,8-Hxcdd	EPA 8290A_1_(2/07)	1
1,2,3,6,7,8-Hxcdf	EPA 8290A_1_(2/07)	1
1,2,3,7,8,9-Hxcdd	EPA 8290A_1_(2/07)	1
1,2,3,7,8,9-Hxcdf	EPA 8290A_1_(2/07)	1
1,2,3,7,8-Pecdd	EPA 8290A_1_(2/07)	1
1,2,3,7,8-Pecdf	EPA 8290A_1_(2/07)	1
2,3,4,6,7,8-Hxcdf	EPA 8290A_1_(2/07)	1
2,3,4,7,8-Pecdf	EPA 8290A_1_(2/07)	1
2,3,7,8-TCDD	EPA 8290A_1_(2/07)	1
2,3,7,8-TCDF	EPA 8290A_1_(2/07)	1
Hpcdd, total	EPA 8290A_1_(2/07)	1
Hpcdf, total	EPA 8290A_1_(2/07)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Hxcdd, total	EPA 8290A_1_(2/07)	1
Hxcdf, total	EPA 8290A_1_(2/07)	1
Pecdd, total	EPA 8290A_1_(2/07)	1
Pecdf, total	EPA 8290A_1_(2/07)	1
TCDD, total	EPA 8290A_1_(2/07)	1
TCDF, total	EPA 8290A_1_(2/07)	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H,-Perfluorodecanesulfonic acid (8:2 FTS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H,-Perfluorooctansulfonic acid (6:2 FTS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2-FTS)	SOP WS-LC-0025	1,3
1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	SOP WS-LC-0025	1,3
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	SOP WS-LC-0025	1,3
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	SOP WS-LC-0025	1,3
Hexafluoropropylene oxide dimer acid (HFPO-DA)	SOP WS-LC-0025	1,3
N-Ethylperfluorooctane sulfonamide (EtFOSA)	SOP WS-LC-0025	1,3
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	SOP WS-LC-0025	1,3
N-Ethylperfluorooctanesulfonamidoethanol (EtFOSE)	SOP WS-LC-0025	1,3
N-Methylperfluorooctane sulfonamide (MeFOSA)	SOP WS-LC-0025	1,3
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	SOP WS-LC-0025	1,3
N-Methylperfluorooctanesulfonamidoethanol (MeFOSE)	SOP WS-LC-0025	1,3
Perfluorobutane sulfonic acid (PFBS)	SOP WS-LC-0025	1,3
Perfluorobutanoic acid (PFBA)	SOP WS-LC-0025	1,3
Perfluorodecane sulfonate (PFDS)	SOP WS-LC-0025	1,3
Perfluorodecane sulfonic acid (PFDS)	SOP WS-LC-0025	1,3
Perfluorodecanoic acid (PFDA)	SOP WS-LC-0025	1,3
Perfluorododecane sulfonic acid (PFDoS)	SOP WS-LC-0025	1,3
Perfluorododecanoic acid (PFDoA)	SOP WS-LC-0025	1,3
Perfluoroheptane sulfonic acid (PFHpS)	SOP WS-LC-0025	1,3
Perfluoroheptanoic acid (PFHpA)	SOP WS-LC-0025	1,3
Perfluorohexane sulfonic acid (PFHxS)	SOP WS-LC-0025	1,3
Perfluorohexanoic acid (PFHxA)	SOP WS-LC-0025	1,3
Perfluorononane sulfonic acid (PFNS)	SOP WS-LC-0025	1,3
Perfluorononanoic acid (PFNA)	SOP WS-LC-0025	1,3
Perfluorooctane sulfonamide (PFOSA)	SOP WS-LC-0025	1,3
Perfluorooctane sulfonic acid (PFOS)	SOP WS-LC-0025	1,3
Perfluorooctanoic acid (PFOA)	SOP WS-LC-0025	1,3
Perfluoropentane sulfonic acid (PFPeS)	SOP WS-LC-0025	1,3

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Perfluoropentanoic acid (PFPeA)	SOP WS-LC-0025	1,3
Perfluorotetradecanoic acid (PFTeDA)	SOP WS-LC-0025	1,3
Perfluorotridecanoic acid (PFTrDA)	SOP WS-LC-0025	1,3
Perfluoroundecanoic acid (PFUnA)	SOP WS-LC-0025	1,3

Accredited Parameter Note Detail

(1) Accreditation based in part on recognition of Oregon NELAP accreditation. (2)Aqueous Matrices only. (3) Based on Labs EPA 537-Modified 1.1 ORELAP accreditation.

Rebecca Wood

04/29/2022

Authentication Signature
Rebecca Wood, Lab Accreditation Unit Supervisor

Date

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

EUROFINS LANCASTER LABORATORIES ENVIRONMENT TESTING LLC
2425 New Holland Pike
Lancaster, PA 17601
Dorothy M. Love Phone: 717-556-7327

ENVIRONMENTAL

Valid To: November 30, 2022 Certificate Number: 0001.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the laboratory's compliance with the 2009 TNI Environmental Testing Laboratory Standard, and the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 5.4 of the DoD/DOE Quality Systems Manual for Environmental Laboratories, accreditation is granted to this laboratory to perform recognized EPA methods using the following testing technologies and in the analyte categories identified below:

Testing Technologies

Atomic Absorption/ICP-AES Spectrometry, ICP-MS Spectrometry, Gas Chromatography, Gas Chromatography/Mass Spectrometry, Gravimetry, High Performance Liquid Chromatography, Ion Chromatography, Misc.-Electronic Probes (pH, F^-, O_2), Oxygen Demand, Spectrophotometry (Visible), Spectrophotometry (Automated), Titrimetry, TCLP, Total Organic Carbon, Turbidity, Liquid Chromatography/Mass Spectrometry/Mass Spectrometry, High Resolution Gas Chromatography/Mass Spectrometry

Parameter/Analyte	**Drinking Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Demands				
COD	---------------	EPA 410.4	---------------	---------------
Total Organic Carbon	---------------	EPA 9060A SM 5310C-2011	EPA 9060A SM 5310C-2011	EPA 9060A SM 5310 B-2011
Anions				
Ammonia	---------------	EPA 350.1	EPA 350.1	SM 4500-NH3 B/C-2011
Fluoride	---------------	EPA 300.0 EPA 9056A	EPA 9056A	EPA 9056A EPA 300.0
Nitrate (as N)	---------------	EPA 300.0 EPA 9056A	EPA 9056A	EPA 9056A EPA 300.0
Nitrite (as N)	---------------	EPA 300.0 EPA 9056A	EPA 9056A	EPA 9056A EPA 300.0

Parameter/Analyte	**Drinking Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Bromide	------------------	EPA 300.0 EPA 9056A	EPA 9056A	EPA 9056A EPA 300.0
Chloride	------------------	EPA 300.0 EPA 9056A	EPA 9056A	EPA 9056A EPA 300.0
Sulfate	------------------	EPA 300.0 EPA 9056A	EPA 9056A	EPA 9056A EPA 300.0
Wet Chemistry				
Alkalinity	------------------	SM 2320B-2011	---------------	---------------
Corrosivity	------------------	---------------	SW-846 Chapter 7	SW-846 Chapter 7
Cyanide	------------------	EPA 9012B	EPA 9012B	EPA 9012B
Filterable Residue (TDS)	------------------	SM 2540C-2011	---------------	---------------
Flashpoint	------------------	---------------	EPA1010A	EPA 1010A
Grain Size	------------------	---------------	---------------	ASTM D422 MOD
Hexavalent Chromium Digestion	------------------	---------------	---------------	EPA 3060A
Hexavalent Chromium	------------------	EPA 7196A EPA 7199	EPA 7196A EPA 7199	EPA 7196A EPA 7199
Ignitability	------------------	---------------	40 CFR 261.21	40 CFR 261.21
Nitrate/Nitrite	------------------	---------------	EPA 353.2	---------------
Non-filterable Residue (TSS)	------------------	SM 2540D-2011	---------------	---------------
pH	------------------	SM 4500 H+B-2011 EPA 9040B EPA 9040C	EPA 9040B EPA 9040C	EPA 9045C EPA 9045D
Phenol	------------------	EPA 9066	EPA 9066	---------------
Reactivity	------------------	---------------	SW-846 Chapter 7.3	SW-846 Chapter 7.3
Sulfide	------------------	EPA 376.1 EPA 376.2 SM 4500 S2D-2011 SM 4500 S2F-2011	---------------	---------------
Total Residue	------------------	SM 2540B-2011	---------------	SM 2540G-2011
Metals				
Metals Digestion	------------------	EPA 3005A EPA 3010A EPA 3020A	EPA 3010A EPA 3020A	EPA 3050B
Aluminum	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Antimony	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Arsenic	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B

Parameter/Analyte	**Drinking Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Barium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Beryllium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Boron	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Cadmium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Calcium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Chromium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Cobalt	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Copper	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Iron	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Lead	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Lithium	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Molybdenum	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Magnesium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B

Parameter/Analyte	**Drinking Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Manganese	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Mercury	------------------	EPA 7470A	EPA 7470A	EPA 7471A EPA 7471B
Nickel	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Potassium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Selenium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Silicon	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Silver	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Sodium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Strontium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Sulfur	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Thallium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Thorium	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Tin	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Titanium	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Tungsten	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D

Parameter/Analyte	**Drinking Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Uranium	------------------	EPA 6020A EPA 6020B	EPA 6020A EPA 6020B	EPA 6020A EPA 6020B
Vanadium	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Zinc	------------------	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B	EPA 6010C EPA 6010D EPA 6020A EPA 6020B
Zirconium	------------------	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D	EPA 6010C EPA 6010D
Purgeable Organics (Volatiles)				
Volatile Preparation	------------------	EPA 5030C	EPA 5030C	EPA 5035A
Acetone	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Acetonitrile	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Acrolein	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Acrylonitrile	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Allyl chloride	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
tert-Amyl Alcohol	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
tert-Amyl Methyl Ether	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
tert-Butyl Alcohol	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
tert-Butyl Formate	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Benzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Bromobenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Bromochloromethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Bromodichloromethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Bromoform	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Bromomethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2-Butanone	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
n-Butylbenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
sec-Butylbenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
tert-Butylbenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Carbon disulfide	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Carbon tetrachloride	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2-Chloro-1,3-butadiene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Chloroacetonitrile	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Chlorobenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1-Chlorobutane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Chlorodifluoromethane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Chloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2-Chloroethyl Vinyl Ether	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Chloroform	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D

Parameter/Analyte	**Drinking Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
1-Chlorohexane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Chloromethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2-Chlorotoluene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
4-Chlorotoluene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Cyclohexane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Cyclohexanone	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Di-Isopropyl ether	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Dibromochloromethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2-Dibromo-3-chloropropane	EPA 524.2	EPA 8260C/D EPA 8011	EPA 8260C/D EPA 8011	EPA 8260C/D
Dibromomethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2-Dibromoethane (EDB)	------------------	EPA 8260C/D EPA 8011	EPA 8260C/D EPA 8011	EPA 8260C/D
1,2-Dichlorobenzene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,3-Dichlorobenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,4-Dichlorobenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
trans-1,4-dichloro-2-butene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Dichlorodi-fluoromethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1-Dichloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2-Dichloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1-Dichloroethene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
cis-1,2-Dichloroethene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
trans-1,2-Dichloroethene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Dichlorofluoromethane	EPA 524.2	---------------	---------------	---------------
1,2-Dichloropropane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,3-Dichloropropane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2,2-Dichloropropane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1-Dichloropropene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
cis-1,3-Dichloropropene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
trans-1,3-Dichloropropene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,4-Dioxane	------------------	EPA 8260C/D EPA 8260C/D SIM	EPA 8260C/D EPA 8260C/D SIM	EPA 8260C/D EPA 8260C/D SIM
Ethanol	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Ethylbenzene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Ethyl ether	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Ethyl Methacrylate	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Ethyl Tert-Butyl Ether	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Freon-113	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Gasoline Range Organics (GRO) [Volatile Petroleum Hydrocarbons (VPH)]	------------------	EPA 8015C EPA 8015D EPA 8260C/D NW TPH-Gx MA VPH AK101	EPA 8015C EPA 8015D EPA 8260C/D NW TPH-Gx MA VPH AK101	EPA 8015C EPA 8015D EPA 8260C/D NW TPH-Gx MA VPH AK101
Heptane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Hexane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2-Hexanone	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Hexachlorobutadiene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Hexachloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Isobutyl Alcohol	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Isopropyl Alcohol	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Isopropylbenzene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,4-Isopropyltoluene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methylacrylonitrile	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Acetate		EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Acrylate	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Iodide	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Ethyl ketone	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methylene Chloride	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Isobutyl Ketone	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Methacrylate	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methyl Tert-Butyl Ether	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
4-Methyl-2-pentanone	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Methylcyclohexane		EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
2-Nitropropane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Naphthalene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Pentachloroethane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Propionitrile	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
n-Propylbenzene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Styrene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Tert-Amyl Ethyl Ether		EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1,1,2-Tetrachloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1,2,2-Tetrachloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Tetrachloroethene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Tetrahydrofuran	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Toluene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2,3-Trichlorobenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2,4-Trichlorobenzene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1,1-Trichloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,1,2-Trichloroethane	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Trichloroethene	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Trichlorofluoromethane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2,3-Trichloropropane	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2,4-Trimethylbenzene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,3,5-Trimethylbenzene	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Vinyl Acetate	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Vinyl Chloride	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
Xylenes, Total	------------------	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,2-Xylene (o-Xylene)	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D
1,3+1,4-Xylene (m+p Xylene)	EPA 524.2	EPA 8260C/D	EPA 8260C/D	EPA 8260C/D

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Extractable Organics (Semivolatiles)				
Acenaphthene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Acenaphthylene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Acetophenone	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Acetylaminofluorene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Alkylated PAHs	------------------	EPA 8270D/E SIM	EPA 8270D/E SIM	EPA 8270D/E SIM
4-Aminobiphenyl	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Amino-4,6-dinitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
4-Amino-2,6-dinitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
Aniline	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Anthracene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Atrazine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Benzaldehyde	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Benzidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Benzoic acid	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Benzo (a) anthracene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Benzo (b) fluoranthene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Benzo (k) fluoranthene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Benzo (ghi) perylene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Benzo (a) pyrene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Benzo (e) pyrene	------------------	EPA 8270D/E SIM	EPA 8270D/E SIM	EPA 8270D/E SIM
Benzyl Alcohol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Biphenyl	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
bis (2-Chloroethoxy) Methane	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
bis (2-Chloroethyl) Ether	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
bis (2-Chloroisopropyl) Ether	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
bis (2-Ethylhexyl) Phthalate	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
4-Bromophenylphenyl Ether	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Butyl benzyl Phthalate	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM

Parameter/Analyte	Potable Water	Non-Potable Water	Solid Hazardous Waste	
			Aqueous	Solid
Caprolactam	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Carbazole	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Carbon Range Organics C8-C44 (including subsets of this range i.e. HRO, MRO, ORO, RRO)	------------------	EPA 8015C EPA 8015D	EPA 8015C EPA 8015D	EPA 8015C EPA 8015D
4-Chloroaniline	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
4-Chloro-3-methylphenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Chlorobenzilate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1-Chloronaphthalene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Chloronaphthalene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Chlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
4-Chlorophenyl phenyl ether	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Chrysene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Cresols (Methyl phenols)	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
cis-/trans-Diallate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,4-Diamino-6-nitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
2,6-Diamino-4-nitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
Dibenzo (a,h) acridine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Dibenzo (a,h) anthracene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Dibenzofuran	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
1,2-Dichlorobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1,3-Dichlorobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1,4-Dichlorobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
3,3-Dichlorobenzidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Diesel Range Organics (DRO) [Extractable Petroleum Hydrocarbons (EPH)]	------------------	EPA 8015C EPA 8015D NWTPH DX MA EPH TX1005/1006 AK102/103 AK102/103-SV	EPA 8015C EPA 8015D NWTPH DX MA EPH TX1005/1006 AK102/103 AK102/103-SV	EPA 8015C EPA 8015D NWTPH DX MA EPH TX1005/1006 AK102/103
2,4-Dichlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,6-Dichlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Diethyl Phthalate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Dimethoate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
p-Dimethylaminoazobenze	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
7,12-Dimethylbenz (a) anthracene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,4-Dimethylphenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Dimethyl Phthalate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
3,3'-Dimethylbenzidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Di-n-butyl Phthalate	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Di-n-octyl phthalate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
3,5-Dinitroaniline	------------------	EPA 8330B	EPA 8330B	EPA 8330B
1,3-Dinitrobenzene	------------------	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B
1,4-Dinitrobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,4-Dinitrophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,4-Dinitrotoluene	------------------	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B
2,6-Dinitrotoluene	------------------	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B
1,4-Dioxane	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Diphenylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Diphenyl ether	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1,2-Diphenylhydrazine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Ethyl Methane Sulfonate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Fluoroanthene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Fluorene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Hexachlorobenzene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Hexachlorobutadiene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Hexachlorocyclo-pentadiene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Hexachloroethane	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Hexachloropropene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	------------------	EPA 8330B	EPA 8330B	EPA 8330B
Indeno (1,2,3-cd) Pyrene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Isodrin	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Isophorone	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Isosafrole	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
3-Methycholanthrene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Methyl-4,6-dinitrophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Methyl methane sulfonate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1-Methylnaphthalene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
2-Methylnaphthalene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
2-Methylphenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
4-Methylphenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Naphthalene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
1,4-Naphthoquinone	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1-Naphthylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Naphthylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
4-Nitroquinoline-1-oxide	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Nitroaniline	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
3-Nitroaniline	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
4-Nitroaniline	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Nitrobenzene	------------------	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B	EPA 8270D/E EPA 8330B
Nitroglycerin	------------------	EPA 8330B	EPA 8330B	EPA 8330B
2-Nitrophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
4-Nitrophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Nitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
3-Nitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
4-Nitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
5-Nitro-o-toluidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitroso-di-n-butylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosodiethylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosodimethylamine	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
n-Nitrosomethylethylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosomorpholine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosodi-n-propylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosodiphenylamine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosopiperidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
n-Nitrosopyrrolidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	------------------	EPA 8330B	EPA 8330B	EPA 8330B

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
2,2-Oxybis (1-chloropropane)	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Pentachlorobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Pentachloronitrobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Pentachlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Pentaerythritol Tetranitrate (PETN)	------------------	EPA 8330B	EPA 8330B	EPA 8330B
Perylene	------------------	EPA 8270D/E SIM	EPA 8270D/E SIM	EPA 8270D/E SIM
Phenacetin	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Phenanthrene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Phenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2-Picoline	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Pronamide	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Pyrene	------------------	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM	EPA 8270D/E EPA 8270D/E SIM
Pyridine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Safrole	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1,2,4,5- Tetrachlorobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,3,4,6-Tetrachlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Tetraethyl dithiopyrophosphate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Tetraethy lead	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Tetryl	------------------	EPA 8330B	EPA 8330B	EPA 8330B
Thionazin	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
o-Toluidine	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1,2,4-Trichlorobenzene	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
1,3,5-Trinitrobenzene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
2,4,5-Trichlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,4,6-Trichlorophenol	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
O,O,O-Tri-ethylphosphorothioate	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
2,4,6-Trinitrotoluene	------------------	EPA 8330B	EPA 8330B	EPA 8330B
Organochlorine Pesticides				
Aldrin	------------------	EPA 8081B	EPA 8081B	EPA 8081B
alpha-BHC	------------------	EPA 8081B	EPA 8081B	EPA 8081B
beta-BHC	------------------	EPA 8081B	EPA 8081B	EPA 8081B
delta-BHC	------------------	EPA 8081B	EPA 8081B	EPA 8081B
gamma-BHC (Lindane)	------------------	EPA 8081B	EPA 8081B	EPA 8081B

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
alpha-Chlordane	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Chlordane (Technical)	------------------	EPA 8081B	EPA 8081B	EPA 8081B
2,4'-DDD	------------------	EPA 8081B	EPA 8081B	EPA 8081B
2,4'-DDE	------------------	EPA 8081B	EPA 8081B	EPA 8081B
2,4'-DDT	------------------	EPA 8081B	EPA 8081B	EPA 8081B
4,4'-DDD	------------------	EPA 8081B	EPA 8081B	EPA 8081B
4,4'-DDE	------------------	EPA 8081B	EPA 8081B	EPA 8081B
4,4'-DDT	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Dieldrin	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Dinoseb	------------------	EPA 8270D/E	EPA 8270D/E	EPA 8270D/E
Endosulfan I (alpha)	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Endosulfan II (beta)	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Endosulfan Sulfate	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Endrin	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Endrin Aldehyde	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Endrin Ketone	------------------	EPA 8081B	EPA 8081B	EPA 8081B
gamma-Chlordane	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Heptachlor	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Heptachlor Epoxide	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Hexachlorobenzene	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Hexachlorocyclopentadiene	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Methoxychlor	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Mirex	------------------	EPA 8081B	EPA 8081B	EPA 8081B
Toxaphene	------------------	EPA 8081B	EPA 8081B	EPA 8081B
PCBs (Aroclors)				
PCB-1016 (Arochlor)	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1221	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1232	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1242	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1248	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1254	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1260	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1262	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB-1268	------------------	EPA 8082A	EPA 8082A	EPA 8082A
PCB congeners (209)	------------------	EPA 1668A EPA 1668C	EPA 1668A EPA 1668C	EPA 1668A EPA 1668C

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Herbicides				
2,4,5-T	------------------	EPA 8151A	EPA 8151A	EPA 8151A
2,4,5-TP (Silvex)	------------------	EPA 8151A	EPA 8151A	EPA 8151A
2,4-D	------------------	EPA 8151A	EPA 8151A	EPA 8151A
2,4-DB	------------------	EPA 8151A	EPA 8151A	EPA 8151A
Dalapon	------------------	EPA 8151A	EPA 8151A	EPA 8151A
Dicamba	------------------	EPA 8151A	EPA 8151A	EPA 8151A
Dichlorprop	------------------	EPA 8151A	EPA 8151A	EPA 8151A
Dinoseb	------------------	EPA 8151A	EPA 8151A	EPA 8151A
MCPA	------------------	EPA 8151A	EPA 8151A	EPA 8151A
MCPP	------------------	EPA 8151A	EPA 8151A	EPA 8151A
Pentachlorophenol	------------------	EPA 8151A	EPA 8151A	EPA 8151A
PCB Homologues				
Monochlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Dichlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Trichlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Tetrachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Pentachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Hexachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Heptachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Octachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Nonachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Decachlorobiphenyls	------------------	EPA 680	EPA 680	EPA 680
Dioxins/Furans				
2,3,7,8-TCDD	EPA 1613B	EPA 8290A	EPA 8290A	EPA 8290A
2,3,7,8-TCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,7,8-PeCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
2,3,4,7,8-PeCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,7,8-PeCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,4,7,8-HxCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,6,7,8-HxCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
2,3,4,6,7,8-HxCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,7,8,9-HxCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,4,7,8,-HxCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,6,7,8-HxCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,7,8,9-HxCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,4,6,7,8-HpCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,4,7,8,9-HpCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
1,2,3,4,6,7,8-HpCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
OCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
OCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total HpCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total HpCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total HxCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total HxCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total PeCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A

Parameter/Analyte	**Potable Water**	**Non-Potable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Total PeCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total TCDD	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Total TCDF	------------------	EPA 8290A	EPA 8290A	EPA 8290A
Misc. Headspace Analysis				
Carbon dioxide	------------------	RSK-175	RSK-175	------------------
Ethane	------------------	RSK-175	RSK-175	------------------
Ethene	------------------	RSK-175	RSK-175	------------------
Methane	------------------	RSK-175	RSK-175	------------------
Hazardous Waste Characteristics				
Toxicity Characteristic Leaching Procedure	------------------	------------------	EPA 1311	EPA 1311
Synthetic Precipitation Leaching Procedure	------------------	------------------	EPA 1312	EPA 1312
ASTM Leaching Procedure	------------------	------------------	ASTM D3987-85	ASTM D3987-85
Other				
Perchlorate	------------------	EPA 6850	EPA 6850	EPA 6850
Hydrazine	------------------	EPA 8315A MOD	EPA 8315A MOD	EPA 8315A MOD
Formaldehyde	------------------	------------------	EPA 8315A	EPA 8315A
Methylhydrazine	------------------	EPA 8315A MOD	EPA 8315A MOD	EPA 8315A MOD
1,1-Dimethylhydrazine	------------------	EPA 8315A MOD	EPA 8315A MOD	EPA 8315A MOD
Volatile Preparation	------------------	EPA 5030A EPA 5030C	EPA 5030A EPA 5030C	EPA 5035 EPA 5035A
Organic Extraction/Cleanup	------------------	EPA 3510C EPA 3511 EPA 3660B, 3620C, 3665A	EPA 3510C EPA 3511 EPA 3660B, 3620C, 3665A	EPA 3546 EPA 3550C EPA 3660B, 3620C, 3665A, 3640A

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
Per and Polyfluoroalkyl Substances (PFAS)			
N-ethyl Perfluorooctane-Sulfonamidoacetic Acid (NetFOSAA)	EPA 537 EPA 537.1	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 EPA Draft Method 1633
N-methyl Perfluoroctane-Sulfonamidoacetic Acid (NMeFOSAA)	EPA 537 EPA 537.1	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15 EPA Draft Method 1633

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
Perfluorobutanesulfonic Acid (PFBS)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorodecanoic Acid (PFDA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorododecanoic Acid (PFDoDA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluoroheptanoic Acid (PFHpA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorohexanesulfonic Acid (PFHxS)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorohexanoic Acid (PFHxA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorononanoic Acid (PFNA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorooctanesulfonic Acid (PFOS)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
Perfluorooctanoic Acid (PFOA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorotetradecanoic Acid (PFTeDA)	EPA 537 EPA 537.1	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorotridecanoic Acid (PFTrDA)	EPA 537 EPA 537.1	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluoroundecanoic Acid (PFUnDA)	EPA 537 EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPODA)	EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	EPA 537.1 EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
Perfluoro-n-butanoic Acid (PFBA)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluoro-n-pentanoic Acid (PFPeA)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
8:2 Fluorotelomersulfonic Acid (8:2FTS)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
4:2 Fluorotelomersulfonic Acid (4:2-FTS)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluoropentanesulfonic Acid (PFPeS)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
6:2 Fluorotelomersulfonic Acid (6:2-FTS)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluoroheptanesulfonic Acid (PFHpS)	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorononanesulfonic Acid (PFNS)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
Perfluorodecanesulfonic Acid (PFDS)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
10:2 Fluorotelomersulfonic Acid (10:2-FTS)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorododecanesulfonic Acid (PFDoDS)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorohexadecanoic Acid (PFHxDA)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorooctadecanoic Acid (PFODA)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
Perfluorooctanesulfonamide (PFOSA)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol (NMePFOSAE)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
N-methylperfluoro-1-octanesulfonamide (NMePFOSA)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
(N-ethylperfluoro-1-octanesulfonamido)-ethanol (NEtPFOSAE)	-------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
N-ethylperfluoro-1-octanesulfonamide (NEtPFOSA)	------------	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
PFECA B	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
PFECA F	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
PFECA A	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
PES	EPA 533	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
3-Perfluoropropylpropanoic acid (3:3 FTCA)	---	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633
3-Perfluoropentylpropanoic acid (5:3 FTCA)	---	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	---	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633	PFAS by LCMSMS Compliant with QSM 5.3/5.4 Table B-15 EPA Draft Method 1633

End of DoD ELAP section of scope

Start of KY, WY, and ISO 17025 section of scope

In addition, in recognition of the successful completion of the A2LA evaluation process (including an assessment of the laboratory's compliance with ISO IEC 17025:2017, the 2009 TNI Environmental Testing Laboratory Standard, and for the test methods applicable to Kentucky Statute KRS 224.60-130(2)(a), and for the test methods applicable to the Wyoming Storage Tank Remediation Laboratory Accreditation Program), accreditation is granted to this laboratory to perform recognized EPA methods using the following testing technologies and in the analyte categories identified below:

Testing Technologies

Atomic Absorption/ICP-AES Spectrometry, ICP-MS Spectrometry, Gas Chromatography, Gas Chromatography/Mass Spectrometry, Gravimetry, High Performance Liquid Chromatography, Ion Chromatography, Misc.-Electronic Probes (pH, F^-, O_2), Oxygen Demand, Spectrophotometry (Visible), Spectrophotometry (Automated), Titrimetry, TCLP, Total Organic Carbon, Turbidity, Liquid Chromatography/Mass Spectrometry/Mass Spectrometry, High Resolution Gas Chromatography/Mass Spectrometry

Parameter/Analyte	**Tissue**	**Nonpotable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Other				
Perchlorate	Food & Food Products EPA 6850	EPA 6850	EPA 6850	EPA 6850
Hydrazine	--------------	EPA 8315A MOD	EPA 8315A MOD	EPA 8315A MOD
Methylhydrazine	--------------	EPA 8315A MOD	EPA 8315A MOD	EPA 8315A MOD
1,1-Dimethylhydrazine	--------------	EPA 8315A MOD	EPA 8315A MOD	EPA 8315A MOD
Volatile Preparation	--------------	EPA 5030A EPA 5030C	EPA 5030A EPA 5030C	EPA 5035 EPA 5035A

Parameter/Analyte	**Tissue**	**Nonpotable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Organic Extraction/ Cleanup	EPA 3546 EPA 3550C EPA 3660B EPA 3620C EPA 3665A EPA 3640A	EPA 3510C EPA 3511 EPA 3660B EPA 3620C EPA 3665A	EPA 3510C EPA 3511 EPA 3660B EPA 3620C EPA 3665A	EPA 3546 EPA 3550C EPA 3660B EPA 3620C EPA 3665A EPA 3640A

Parameter/Analyte	**Tissue**	**Nonpotable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Kentucky UST Program				
Metals				
Arsenic	--------------	------------------	EPA 6010B	EPA 6010B
Barium	--------------	------------------	EPA 6010B	EPA 6010B
Cadmium	--------------	------------------	EPA 6010B	EPA 6010B
Chromium	--------------	------------------	EPA 6010B	EPA 6010B
Lead	--------------	------------------	EPA 6010B	EPA 6010B
Mercury	--------------	------------------	EPA 7470A	EPA 7471A
Selenium	--------------	------------------	EPA 6010B	EPA 6010B
Silver	--------------	------------------	EPA 6010B	EPA 6010B
Purgeable Organics (Volatiles)				
Diesel Range Organics (DRO)	--------------	EPA 8015C EPA 8015D	EPA 8015C EPA 8015D	EPA 8015C EPA 8015D
Gasoline Range Organics (GRO)	--------------	EPA 8015C EPA 8015D	EPA 8015C EPA 8015D	EPA 8015C EPA 8015D
Wyoming Storage Tank Program				
Metals				
Cadmium	--------------	------------------	EPA 6010C	EPA 6010C
Chromium	--------------	------------------	EPA 6010C	EPA 6010C
Chromium (Total, hexavalent)	--------------	------------------	EPA 7196A	EPA 7196A
Lead	--------------	------------------	EPA 6010C	EPA 6010C
Purgeable Organics (Volatiles)				
Volatile Preparation	--------------	------------------	EPA 5030C EPA 5030C	EPA 5035 EPA 5035A
Benzene	--------------	------------------	EPA 5030C EPA 8260D	EPA 8260D
1,2-Dichloroethane	--------------	------------------	EPA 8260D	EPA 8260D
1,2-Dibromoethane	--------------	------------------	EPA 8011	EPA 8011
Diisopropyl Ether	--------------	------------------	EPA 5030C EPA 8260D	EPA 8260D
Ethyl Benzene	--------------	------------------	EPA 5030C EPA 8260D	EPA 8260D
Ethyl tert-butyl Ether	--------------	------------------	EPA 8260D	EPA 8260D

Parameter/Analyte	**Tissue**	**Nonpotable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
Methyl tert-butyl Ether	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Naphthalene	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Toluene	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Tert-amyl Methyl Ether	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Tert-butyl Alcohol	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Xylenes, total	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Gasoline Range Organics (GRO C6-C10)	-------------	-----------------	EPA 5030C EPA 8260D	EPA 8260D
Extractable Organics (Semivolatiles)				
Diesel Range Organics (DRO C10-C32)	-------------	-----------------	EPA 8015C w/ EPA 3630 cleanup	EPA 8015C w/ EPA 3630 cleanup

Food and Feed (WHO 29)	**Food/Feed**
2,3,7,8-TCDD	EPA 1613B
2,3,7,8-TCDF	EPA 1613B
1,2,3,7,8-PeCDF	EPA 1613B
2,3,4,7,8-PeCDF	EPA 1613B
1,2,3,7,8-PeCDD	EPA 1613B
1,2,3,4,7,8-HxCDF	EPA 1613B
1,2,3,6,7,8-HxCDF	EPA 1613B
2,3,4,6,7,8-HxCDF	EPA 1613B
1,2,3,7,8,9-HxCDF	EPA 1613B
1,2,3,4,7,8-HxCDD	EPA 1613B
1,2,3,6,7,8-HxCDD	EPA 1613B
1,2,3,7,8,9-HxCDD	EPA 1613B
1,2,3,4,6,7,8-HpCDF	EPA 1613B
1,2,3,4,7,8,9-HpCDF	EPA 1613B
1,2,3,4,6,7,8-HpCDD	EPA 1613B
OCDF	EPA 1613B
OCDD	EPA 1613B
Food and Feed (WHO 29)	**Food/Feed**
Total HpCDD	EPA 1613B
Total HpCDF	EPA 1613B
Total HxCDD	EPA 1613B
Total HxCDF	EPA 1613B
Total PeCDD	EPA 1613B
Total PeCDF	EPA 1613B

Total TCDD	EPA 1613B
Total TCDF	EPA 1613B
6 marker PCBs (PCB28, PCB52, PCB101, PCB138, PCB153, and PCB180)	EPA 1668A EPA 1668C

Parameter/Analyte	**Tissue**	**Nonpotable Water**	**Solid Hazardous Waste**	
			Aqueous	**Solid**
12 Dioxin-like PCBs (dl-PCBs)/coplanar PCBs (PCB77, PCB81, PCB105, PCB114, PCB118, PCB123, PCB126, PCB156, PCB157, PCB167, PCB169, and PCB189)	EPA 1668A EPA 1668C	------------------	---------------	---------------

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
Per and Polyfluoroalkyl Substances (PFAS)			
N-ethyl perfluorooctane-sulfonamidoacetic acid (NetFOSAA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
N-methyl perfluoroctane-sulfonamidoacetic acid (NMeFOSAA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorobutanesulfonic acid (PFBS)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorodecanoic acid (PFDA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorododecanoic acid (PFDoDA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluoroheptanoic acid (PFHpA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorohexanesulfonic acid (PFHxS)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorohexanoic acid (PFHxA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorononanoic acid (PFNA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorooctanesulfonic acid (PFOS)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorooctanoic acid (PFOA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorotetradecanoic acid (PFTeDA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod

Perfluorotridecanoic acid (PFTrDA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluoroundecanoic acid (PFUnDA)	EPA 537 Ver. 1.1 EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPODA)	EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod

Parameter/Analyte	**Drinking Water**	**Nonpotable Water**	**Solid Haz.Waste**
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	EPA 537.1	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluoro-n-butanoic acid (PFBA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluoro-n-pentanoic acid (PFPeA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
8:2 Fluorotelomersulfonic acid (8:2FTS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
4:2 Fluorotelomersulfonic acid (4:2-FTS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluoropentanesulfonic acid (PFPeS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
6:2 Fluorotelomersulfonic acid (6:2-FTS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluoroheptanesulfonic acid (PFHpS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorononanesulfonic acid (PFNS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorodecanesulfonic acid (PFDS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
10:2 Fluorotelomersulfonic acid (10:2-FTS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorododecanesulfonic acid (PFDoDS)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorohexadecanoic acid (PFHxDA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorooctadecanoic acid (PFODA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
Perfluorooctanesulfonamide (PFOSA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol (NMePFOSAE)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
N-methylperfluoro-1-octanesulfonamide (NMePFOSA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol (NEtPFOSAE)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod
N-ethylperfluoro-1-octanesulfonamide (NEtPFOSA)	---------------------	EPA 537 Ver.1.1 Mod	EPA 537 Ver.1.1 Mod

End of KY, WY, and ISO 17025 section of scope

Accredited Laboratory

A2LA has accredited

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC

Lancaster, PA

for technical competence in the field of

Environmental Testing

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2017, the 2009 TNI Environmental Testing Laboratory Standard, and the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 5.4 of the DoD/DOE Quality System Manual for Environmental Laboratories (QSM), accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated *April 2017*).

Presented this 28th day of January 2021.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1.01
Valid to November 30, 2022

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 488 • Manchester, WA 98353-0488 • (360) 871-8840

May 03, 2022

Ann O'Donnell
Eurofins Lancaster Laboratories Environmental Testing, LLC
2425 New Holland Pike
Lancaster, PA 17601

Dear Ann O'Donnell:

Thank you for your request to update some of your Non-Potable Water methods to the most recent version approved by 40CFR 136.3. The following parameters have been added to your scope of accreditation in Good Standing in recognition of your Pennsylvania DEP accreditation. They replace the accreditation previously held by an older version of the method.

- Total Solids by SM 2540 B-2015 in Non-Potable Water
- Total Dissolved Solids by SM 2540 C-2015 in Non-Potable Water
- Total Suspended Solids by SM 2540 D-2015 in Non-Potable Water
- Settleable Solids by SM 2540 F-2015 in Non-Potable Water
- Biological Oxygen Demand (BOD) by SM 5210 B-2016 in Non-Potable Water
- Carbonaceous BOD by SM 5210 B-2016 in Non-Potable Water
- Total Organic Carbon (TOC) by SM 5310 C-2014 in Non-Potable Water
- Dissolved Organic Carbon (DOC) by SM 5310 C-2014 in Non-Potable Water
- Total Cyanide by ASTM D7511-12 (2017) in Non-Potable Water

Renewal of accreditation is based in part on review of your lab’s performance over the past year as evidenced by participation in proficiency testing (PT) studies. In general, full accreditation is awarded for those parameters for which the two most recent PT results, if applicable, were rated satisfactory. Provisional accreditation is awarded if the latest of the two most recent PT results was rated “Not Acceptable” or only one PT result was submitted during the past twelve months. Accreditation is withheld for those parameters for which the two most recent PT results were rated “Not Acceptable” or no PT results were submitted during the past twelve-months.

As a reminder, continued participation in the Ecology Lab Accreditation Program requires the lab to:

- Submit a renewal application and fees annually
- Report significant changes in facility, personnel, analytical methods, equipment, the lab’s quality assurance (QA) manual or QA procedures as they occur
- **Participate in proficiency testing studies semi-annually, with the following exception: For each parameter where all PT results were satisfactory, you are required to submit only one PT result over this next year, and in subsequent years, as long as the results are satisfactory.**
- Submit copies of current third-party Scopes of Accreditation when they are available.

YOUR RIGHT TO APPEAL

You have a right to appeal Ecology's decision to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this decision letter. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this decision:

- File your appeal and a copy of this decision with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this decision on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	**Mailing Addresses**
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

If you have any questions concerning the accreditation of your lab, please contact Ryan Zboralski at (360) 871-8845, fax (360) 871-8849, or by e-mail at ryan.zboralski@ecy.wa.gov.

Sincerely,

Rebecca Wood
Lab Accreditation Unit Supervisor

RW:ERZ:erz
Enclosures

WASHINGTON STATE DEPARTMENT OF ECOLOGY

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

SCOPE OF ACCREDITATION

Eurofins Lancaster Laboratories Environmental Testing, LLC

Lancaster, PA

is accredited for the analytes listed below using the methods indicated. Full accreditation is granted unless stated otherwise in a note. EPA is the U.S. Environmental Protection Agency. SM is "Standard Methods for the Examination of Water and Wastewater." SM refers to EPA approved method versions. ASTM is the American Society for Testing and Materials. USGS is the U.S. Geological Survey. AOAC is the Association of Official Analytical Chemists. Other references are described in notes.

Matrix/Analyte	Method	Notes
Air		
1,1,1,2-Tetrachloroethane	EPA TO-15 Rev. 2 (1999)	2
1,1,1-Trichloroethane	EPA TO-15 Rev. 2 (1999)	2
1,1,2,2-Tetrachloroethane	EPA TO-15 Rev. 2 (1999)	2
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA TO-15 Rev. 2 (1999)	2
1,1,2-Trichloroethane	EPA TO-15 Rev. 2 (1999)	2
1,1-Dichloroethane	EPA TO-15 Rev. 2 (1999)	2
1,1-Dichloroethylene	EPA TO-15 Rev. 2 (1999)	2
1,2,3-Trichloropropane	EPA TO-15 Rev. 2 (1999)	2
1,2,4-Trichlorobenzene	EPA TO-15 Rev. 2 (1999)	2
1,2,4-Trimethylbenzene	EPA TO-15 Rev. 2 (1999)	2
1,2-Dibromo-3-chloropropane (DBCP)	EPA TO-15 Rev. 2 (1999)	2
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA TO-15 Rev. 2 (1999)	2
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	EPA TO-15 Rev. 2 (1999)	2
1,2-Dichlorobenzene	EPA TO-15 Rev. 2 (1999)	2
1,2-Dichloroethane (Ethylene dichloride)	EPA TO-15 Rev. 2 (1999)	2
1,2-Dichloropropane	EPA TO-15 Rev. 2 (1999)	2
1,3,5-Trimethylbenzene	EPA TO-15 Rev. 2 (1999)	2
1,3-Butadiene	EPA TO-15 Rev. 2 (1999)	2
1,3-Dichlorobenzene	EPA TO-15 Rev. 2 (1999)	2
1,4-Dichlorobenzene	EPA TO-15 Rev. 2 (1999)	2
1,4-Dioxane (1,4- Diethyleneoxide)	EPA TO-15 Rev. 2 (1999)	2
1-Propene	EPA TO-15 Rev. 2 (1999)	2
2,2,4-Trimethylpentane	EPA TO-15 Rev. 2 (1999)	2
2-Butanone (Methyl ethyl ketone, MEK)	EPA TO-15 Rev. 2 (1999)	2
2-Chlorotoluene	EPA TO-15 Rev. 2 (1999)	2
2-Hexanone	EPA TO-15 Rev. 2 (1999)	2

Matrix/Analyte	Method	Notes
Air		
4-Ethyltoluene	EPA TO-15 Rev. 2 (1999)	2
4-Methyl-2-pentanone (MIBK)	EPA TO-15 Rev. 2 (1999)	2
Acetone	EPA TO-15 Rev. 2 (1999)	2
Acetonitrile	EPA TO-15 Rev. 2 (1999)	2
Acrolein (Propenal)	EPA TO-15 Rev. 2 (1999)	2
Acrylonitrile	EPA TO-15 Rev. 2 (1999)	2
Allyl chloride (3-Chloropropene)	EPA TO-15 Rev. 2 (1999)	2
Benzene	EPA TO-15 Rev. 2 (1999)	2
Benzyl chloride	EPA TO-15 Rev. 2 (1999)	2
Bromobenzene	EPA TO-15 Rev. 2 (1999)	2
Bromodichloromethane	EPA TO-15 Rev. 2 (1999)	2
Bromoform	EPA TO-15 Rev. 2 (1999)	2
Carbon disulfide	EPA TO-15 Rev. 2 (1999)	2
Carbon tetrachloride	EPA TO-15 Rev. 2 (1999)	2
Chlorobenzene	EPA TO-15 Rev. 2 (1999)	2
Chlorodibromomethane	EPA TO-15 Rev. 2 (1999)	2
Chlorodifluoromethane (Freon-22)	EPA TO-15 Rev. 2 (1999)	2
Chloroform	EPA TO-15 Rev. 2 (1999)	2
cis & trans-1,2-Dichloroethene	EPA TO-15 Rev. 2 (1999)	2
cis-1,2-Dichloroethylene	EPA TO-15 Rev. 2 (1999)	2
cis-1,3-Dichloropropene	EPA TO-15 Rev. 2 (1999)	2
Cyclohexane	EPA TO-15 Rev. 2 (1999)	2
Dibromomethane	EPA TO-15 Rev. 2 (1999)	2
Dichlorodifluoromethane (Freon-12)	EPA TO-15 Rev. 2 (1999)	2
Dichlorofluoromethane (Freon 21)	EPA TO-15 Rev. 2 (1999)	2
Di-isopropylether (DIPE)	EPA TO-15 Rev. 2 (1999)	2
Ethanol	EPA TO-15 Rev. 2 (1999)	2
Ethyl acetate	EPA TO-15 Rev. 2 (1999)	2
Ethyl acrylate	EPA TO-15 Rev. 2 (1999)	2
Ethyl chloride	EPA TO-15 Rev. 2 (1999)	2
Ethyl methacrylate	EPA TO-15 Rev. 2 (1999)	2
Ethyl tert-Butyl Ether	EPA TO-15 Rev. 2 (1999)	2
Ethylbenzene	EPA TO-15 Rev. 2 (1999)	2
Hexachlorobutadiene	EPA TO-15 Rev. 2 (1999)	2
Hexachloroethane	EPA TO-15 Rev. 2 (1999)	2
Hexane	EPA TO-15 Rev. 2 (1999)	2
Iodomethane (Methyl iodide)	EPA TO-15 Rev. 2 (1999)	2

Matrix/Analyte	Method	Notes
Air		
Isopropyl alcohol (2-Propanol)	EPA TO-15 Rev. 2 (1999)	2
Isopropylbenzene	EPA TO-15 Rev. 2 (1999)	2
m+p-xylene	EPA TO-15 Rev. 2 (1999)	2
Methyl acrylate	EPA TO-15 Rev. 2 (1999)	2
Methyl bromide (Bromomethane)	EPA TO-15 Rev. 2 (1999)	2
Methyl chloride (Chloromethane)	EPA TO-15 Rev. 2 (1999)	2
Methyl isobutyl ketone (Hexone)	EPA TO-15 Rev. 2 (1999)	2
Methyl methacrylate	EPA TO-15 Rev. 2 (1999)	2
Methyl tert-butyl ether (MTBE)	EPA TO-15 Rev. 2 (1999)	2
Methylene chloride (Dichloromethane)	EPA TO-15 Rev. 2 (1999)	2
Naphthalene	EPA TO-15 Rev. 2 (1999)	2
n-Butylbenzene	EPA TO-15 Rev. 2 (1999)	2
n-Heptane	EPA TO-15 Rev. 2 (1999)	2
n-Octane	EPA TO-15 Rev. 2 (1999)	2
n-Pentane	EPA TO-15 Rev. 2 (1999)	2
n-Propylbenzene	EPA TO-15 Rev. 2 (1999)	2
o-Xylene	EPA TO-15 Rev. 2 (1999)	2
sec-Butylbenzene	EPA TO-15 Rev. 2 (1999)	2
Styrene	EPA TO-15 Rev. 2 (1999)	2
tert-amylmethylether (TAME)	EPA TO-15 Rev. 2 (1999)	2
tert-Butyl alcohol	EPA TO-15 Rev. 2 (1999)	2
tert-Butylbenzene	EPA TO-15 Rev. 2 (1999)	2
Tetrachloroethylene (Perchloroethylene)	EPA TO-15 Rev. 2 (1999)	2
Tetrahydrofuran (THF)	EPA TO-15 Rev. 2 (1999)	2
Toluene	EPA TO-15 Rev. 2 (1999)	2
trans-1,2-Dichloroethylene	EPA TO-15 Rev. 2 (1999)	2
trans-1,3-Dichloropropylene	EPA TO-15 Rev. 2 (1999)	2
Trichloroethene (Trichloroethylene)	EPA TO-15 Rev. 2 (1999)	2
Trichlorofluoromethane (Freon 11)	EPA TO-15 Rev. 2 (1999)	2
Vinyl acetate	EPA TO-15 Rev. 2 (1999)	2
Vinyl bromide	EPA TO-15 Rev. 2 (1999)	2
Vinyl chloride	EPA TO-15 Rev. 2 (1999)	2
Xylene (total)	EPA TO-15 Rev. 2 (1999)	2
Drinking Water		
Barium	EPA 200.7_4.4_1994	1
Calcium	EPA 200.7_4.4_1994	1
Chromium	EPA 200.7_4.4_1994	1

Matrix/Analyte	Method	Notes
Drinking Water		
Cobalt	EPA 200.7_4.4_1994	1
Copper	EPA 200.7_4.4_1994	1
Iron	EPA 200.7_4.4_1994	1
Lithium	EPA 200.7_4.4_1994	1
Magnesium	EPA 200.7_4.4_1994	1
Manganese	EPA 200.7_4.4_1994	1
Nickel	EPA 200.7_4.4_1994	1
Potassium	EPA 200.7_4.4_1994	1
Silver	EPA 200.7_4.4_1994	1
Sodium	EPA 200.7_4.4_1994	1
Strontium	EPA 200.7_4.4_1994	1
Sulfur	EPA 200.7_4.4_1994	1
Tin	EPA 200.7_4.4_1994	1
Vanadium	EPA 200.7_4.4_1994	1
Zinc	EPA 200.7_4.4_1994	1
Aluminum	EPA 200.8_5.4_1994	1
Antimony	EPA 200.8_5.4_1994	1
Arsenic	EPA 200.8_5.4_1994	1
Barium	EPA 200.8_5.4_1994	1
Beryllium	EPA 200.8_5.4_1994	1
Cadmium	EPA 200.8_5.4_1994	1
Chromium	EPA 200.8_5.4_1994	1
Copper	EPA 200.8_5.4_1994	1
Lead	EPA 200.8_5.4_1994	1
Manganese	EPA 200.8_5.4_1994	1
Nickel	EPA 200.8_5.4_1994	1
Potassium	EPA 200.8_5.4_1994	1
Selenium	EPA 200.8_5.4_1994	1
Strontium	EPA 200.8_5.4_1994	1
Thallium	EPA 200.8_5.4_1994	1
Zinc	EPA 200.8_5.4_1994	1
Mercury	EPA 245.1_3_1994	1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613B_1994	1
1,1,1,2-Tetrachloroethane	EPA 524.2_4.1_1995	1
1,1,1-Trichloroethane	EPA 524.2_4.1_1995	1
1,1,2,2-Tetrachloroethane	EPA 524.2_4.1_1995	1
1,1,2-Trichloroethane	EPA 524.2_4.1_1995	1

Matrix/Analyte	Method	Notes
Drinking Water		
1,1-Dichloroethane	EPA 524.2_4.1_1995	1
1,1-Dichloroethylene	EPA 524.2_4.1_1995	1
1,1-Dichloropropene	EPA 524.2_4.1_1995	1
1,2,3-Trichlorobenzene	EPA 524.2_4.1_1995	1
1,2,3-Trichloropropane	EPA 524.2_4.1_1995	1
1,2,4-Trichlorobenzene	EPA 524.2_4.1_1995	1
1,2,4-Trimethylbenzene	EPA 524.2_4.1_1995	1
1,2-Dichlorobenzene	EPA 524.2_4.1_1995	1
1,2-Dichloroethane (Ethylene dichloride)	EPA 524.2_4.1_1995	1
1,2-Dichloropropane	EPA 524.2_4.1_1995	1
1,3,5-Trimethylbenzene	EPA 524.2_4.1_1995	1
1,3-Dichlorobenzene	EPA 524.2_4.1_1995	1
1,3-Dichloropropane	EPA 524.2_4.1_1995	1
1,4-Dichlorobenzene	EPA 524.2_4.1_1995	1
1-Chlorobutane	EPA 524.2_4.1_1995	1
2,2-Dichloropropane	EPA 524.2_4.1_1995	1
2-Butanone (Methyl ethyl ketone, MEK)	EPA 524.2_4.1_1995	1
2-Chlorotoluene	EPA 524.2_4.1_1995	1
2-Hexanone	EPA 524.2_4.1_1995	1
2-Nitropropane	EPA 524.2_4.1_1995	1
4-Chlorotoluene	EPA 524.2_4.1_1995	1
4-Isopropyltoluene (p-Cymene)	EPA 524.2_4.1_1995	1
4-Methyl-2-pentanone (MIBK)	EPA 524.2_4.1_1995	1
Acetone	EPA 524.2_4.1_1995	1
Acrylonitrile	EPA 524.2_4.1_1995	1
Allyl chloride (3-Chloropropene)	EPA 524.2_4.1_1995	1
Benzene	EPA 524.2_4.1_1995	1
Bromobenzene	EPA 524.2_4.1_1995	1
Bromochloromethane	EPA 524.2_4.1_1995	1
Bromodichloromethane	EPA 524.2_4.1_1995	1
Bromoform	EPA 524.2_4.1_1995	1
Carbon disulfide	EPA 524.2_4.1_1995	1
Carbon tetrachloride	EPA 524.2_4.1_1995	1
Chloroacetonitrile	EPA 524.2_4.1_1995	1
Chlorobenzene	EPA 524.2_4.1_1995	1
Chlorodibromomethane	EPA 524.2_4.1_1995	1
Chloroethane (Ethyl chloride)	EPA 524.2_4.1_1995	1

Matrix/Analyte	Method	Notes
Drinking Water		
Chloroform	EPA 524.2_4.1_1995	1
cis-1,2-Dichloroethylene	EPA 524.2_4.1_1995	1
cis-1,3-Dichloropropene	EPA 524.2_4.1_1995	1
Dibromomethane	EPA 524.2_4.1_1995	1
Dichlorodifluoromethane (Freon-12)	EPA 524.2_4.1_1995	1
Dichloromethane (DCM, Methylene chloride)	EPA 524.2_4.1_1995	1
Diethyl ether	EPA 524.2_4.1_1995	1
Di-isopropylether (DIPE)	EPA 524.2_4.1_1995	1
Ethyl methacrylate	EPA 524.2_4.1_1995	1
Ethylbenzene	EPA 524.2_4.1_1995	1
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	EPA 524.2_4.1_1995	1
Hexachlorobutadiene	EPA 524.2_4.1_1995	1
Isopropylbenzene	EPA 524.2_4.1_1995	1
m+p-xylene	EPA 524.2_4.1_1995	1
Methacrylonitrile	EPA 524.2_4.1_1995	1
Methyl bromide (Bromomethane)	EPA 524.2_4.1_1995	1
Methyl chloride (Chloromethane)	EPA 524.2_4.1_1995	1
Methyl methacrylate	EPA 524.2_4.1_1995	1
Methyl tert-butyl ether (MTBE)	EPA 524.2_4.1_1995	1
Naphthalene	EPA 524.2_4.1_1995	1
n-Butylbenzene	EPA 524.2_4.1_1995	1
Nitrobenzene	EPA 524.2_4.1_1995	1
n-Propylbenzene	EPA 524.2_4.1_1995	1
o-Xylene	EPA 524.2_4.1_1995	1
Pentachloroethane	EPA 524.2_4.1_1995	1
Propionitrile (Ethyl cyanide)	EPA 524.2_4.1_1995	1
sec-Butylbenzene	EPA 524.2_4.1_1995	1
Styrene	EPA 524.2_4.1_1995	1
tert-amylmethylether (TAME)	EPA 524.2_4.1_1995	1
tert-Butyl alcohol	EPA 524.2_4.1_1995	1
tert-Butylbenzene	EPA 524.2_4.1_1995	1
Tetrachloroethylene (Perchloroethylene)	EPA 524.2_4.1_1995	1
Tetrahydrofuran (THF)	EPA 524.2_4.1_1995	1
Toluene	EPA 524.2_4.1_1995	1
Total Trihalomethanes	EPA 524.2_4.1_1995	1
trans-1,2-Dichloroethylene	EPA 524.2_4.1_1995	1
trans-1,3-Dichloropropene	EPA 524.2_4.1_1995	1

Matrix/Analyte	**Method**	**Notes**
Drinking Water		
trans-1,4-Dichloro-2-butene	EPA 524.2_4.1_1995	1
Trichloroethene (Trichloroethylene)	EPA 524.2_4.1_1995	1
Trichlorofluoromethane (Freon 11)	EPA 524.2_4.1_1995	1
Vinyl chloride	EPA 524.2_4.1_1995	1
Xylene (total)	EPA 524.2_4.1_1995	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	EPA 533	1
1H,1H,2H,2H,-Perfluorodecanesulfonic acid (8:2 FTS)	EPA 533	1
1H,1H,2H,2H,-Perfluorooctansulfonic acid (6:2 FTS)	EPA 533	1
1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	EPA 533	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	EPA 533	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	EPA 533	1
Hexafluoropropylene oxide dimer acid (HFPO-DA)	EPA 533	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	EPA 533	1
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	EPA 533	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	EPA 533	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	EPA 533	1
Perfluorobutane sulfonic acid (PFBS)	EPA 533	1
Perfluorobutanoic acid (PFBA)	EPA 533	1
Perfluorodecanoic acid (PFDA)	EPA 533	1
Perfluorododecanoic acid (PFDoA)	EPA 533	1
Perfluoroheptane sulfonic acid (PFHpS)	EPA 533	1
Perfluoroheptanoic acid (PFHpA)	EPA 533	1
Perfluorohexane sulfonic acid (PFHxS)	EPA 533	1
Perfluorohexanoic acid (PFHxA)	EPA 533	1
Perfluorononanoic acid (PFNA)	EPA 533	1
Perfluorooctane sulfonic acid (PFOS)	EPA 533	1
Perfluorooctanoic acid (PFOA)	EPA 533	1
Perfluoropentane sulfonic acid (PFPeS)	EPA 533	1
Perfluoropentanoic acid (PFPeA)	EPA 533	1
Perfluoroundecanoic acid (PFUnA)	EPA 533	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	EPA 537.1_(11/18)	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	EPA 537.1_(11/18)	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	EPA 537.1_(11/18)	1
Hexafluoropropylene oxide dimer acid (HFPO-DA)	EPA 537.1_(11/18)	1
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 537.1_(11/18)	1
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 537.1_(11/18)	1
Perfluorobutane sulfonic acid (PFBS)	EPA 537.1_(11/18)	1

Matrix/Analyte	Method	Notes
Drinking Water		
Perfluorodecanoic acid (PFDA)	EPA 537.1_(11/18)	1
Perfluorododecanoic acid (PFDoA)	EPA 537.1_(11/18)	1
Perfluoroheptanoic acid (PFHpA)	EPA 537.1_(11/18)	1
Perfluorohexane sulfonic acid (PFHxS)	EPA 537.1_(11/18)	1
Perfluorohexanoic acid (PFHxA)	EPA 537.1_(11/18)	1
Perfluorononanoic acid (PFNA)	EPA 537.1_(11/18)	1
Perfluorooctane sulfonic acid (PFOS)	EPA 537.1_(11/18)	1
Perfluorooctanoic acid (PFOA)	EPA 537.1_(11/18)	1
Perfluorotetradecanoic acid (PFTeDA)	EPA 537.1_(11/18)	1
Perfluorotridecanoic acid (PFTrDA)	EPA 537.1_(11/18)	1
Perfluoroundecanoic acid (PFUnA)	EPA 537.1_(11/18)	1
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 537_1.1_2009	1
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 537_1.1_2009	1
Perfluorobutane sulfonic acid (PFBS)	EPA 537_1.1_2009	1
Perfluorodecanoic acid (PFDA)	EPA 537_1.1_2009	1
Perfluorododecanoic acid (PFDoA)	EPA 537_1.1_2009	1
Perfluoroheptanoic acid (PFHpA)	EPA 537_1.1_2009	1
Perfluorohexane sulfonic acid (PFHxS)	EPA 537_1.1_2009	1
Perfluorohexanoic acid (PFHxA)	EPA 537_1.1_2009	1
Perfluorononanoic acid (PFNA)	EPA 537_1.1_2009	1
Perfluorooctane sulfonic acid (PFOS)	EPA 537_1.1_2009	1
Perfluorooctanoic acid (PFOA)	EPA 537_1.1_2009	1
Perfluorotetradecanoic acid (PFTeDA)	EPA 537_1.1_2009	1
Perfluorotridecanoic acid (PFTrDA)	EPA 537_1.1_2009	1
Perfluoroundecanoic acid (PFUnA)	EPA 537_1.1_2009	1
Non-Potable Water		
Solids, Total	SM 2540 B-2015	1
Cyanide, Total	ASTM D7511-12 (2017)	1
non-Polar Extractable Material (TPH)	EPA 1664B (SGT-HEM)	1
n-Hexane Extractable Material (O&G)	EPA 1664B -10 (HEM)	1
Turbidity	EPA 180.1_2_1993	1
Chromium, Hexavalent	EPA 218.6_3.3_1994	1
Bromide	EPA 300.0_2.1_1993	1
Chloride	EPA 300.0_2.1_1993	1
Fluoride	EPA 300.0_2.1_1993	1
Nitrate	EPA 300.0_2.1_1993	1
Nitrite	EPA 300.0_2.1_1993	1

Matrix/Analyte	**Method**	**Notes**
Non-Potable Water		
Sulfate	EPA 300.0_2.1_1993	1
Cyanide, Total	EPA 335.4_1_1993	1
Ammonia	EPA 350.1_2_1993	1
Nitrogen, Total Kjeldahl	EPA 351.2_2_1993	1
Nitrate	EPA 353.2_2_1993	1
Nitrate + Nitrite	EPA 353.2_2_1993	1
Nitrite	EPA 353.2_2_1993	1
Phosphorus, total	EPA 365.1_2_1993	1
Orthophosphate	EPA 365.3_1978	1
Chemical Oxygen Demand (COD)	EPA 410.4_2_1993	1
Phenolics, Total	EPA 420.4_1_1993	1
Dissolved Oxygen	Hach 10360 rev 1.2	1,11
Cyanide, Free	OIA 1677	1
Color	SM 2120 B-2011	1
Acidity	SM 2310 B-2011	1
Alkalinity	SM 2320 B-2011	1
Hardness, Total (as CaCO3)	SM 2340 C-2011	1
Specific Conductance	SM 2510 B-2011	1
Solids, Total Dissolved	SM 2540 C-2015	1
Solids, Total Suspended	SM 2540 D-2015	1
Solids, Settleable	SM 2540 F-2015	1
Chromium, Hexavalent	SM 3500-Cr B-2011	1
Iron, Ferrous	SM 3500-Fe B-2011	1
Chloride	SM 4500-Cl$^-$ C-2011	1
Fluoride	SM 4500-F$^-$ C-2011	1
pH	SM 4500-H+ B-2011	1,7
Ammonia	SM 4500-NH3 C-2011	1
Ammonia	SM 4500-NH3 D-2011	1
Orthophosphate	SM 4500-P E-2011	1
Phosphorus, Total	SM 4500-P F-2011	1
Sulfide	SM 4500-S2$^-$ D-2011	1
Sulfide	SM 4500-S2$^-$ F-2011	1
Silica	SM 4500-SiO2 C-2011	1
Biochemical Oxygen Demand (BOD)	SM 5210 B-2016	1
Carbonaceous BOD (CBOD)	SM 5210 B-2016	1
Dissolved Organic Carbon	SM 5310 C-2014	1
Total Organic Carbon	SM 5310 C-2014	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Anionic Surfactants (MBAS)	SM 5540 C-2011	1
Aluminum	EPA 200.7_4.4_1994	1
Antimony	EPA 200.7_4.4_1994	1
Arsenic	EPA 200.7_4.4_1994	1
Barium	EPA 200.7_4.4_1994	1
Beryllium	EPA 200.7_4.4_1994	1
Boron	EPA 200.7_4.4_1994	1
Cadmium	EPA 200.7_4.4_1994	1
Calcium	EPA 200.7_4.4_1994	1
Chromium	EPA 200.7_4.4_1994	1
Cobalt	EPA 200.7_4.4_1994	1
Copper	EPA 200.7_4.4_1994	1
Iron	EPA 200.7_4.4_1994	1
Lead	EPA 200.7_4.4_1994	1
Lithium	EPA 200.7_4.4_1994	1
Magnesium	EPA 200.7_4.4_1994	1
Manganese	EPA 200.7_4.4_1994	1
Molybdenum	EPA 200.7_4.4_1994	1
Nickel	EPA 200.7_4.4_1994	1
Potassium	EPA 200.7_4.4_1994	1
Selenium	EPA 200.7_4.4_1994	1
Silver	EPA 200.7_4.4_1994	1
Sodium	EPA 200.7_4.4_1994	1
Strontium	EPA 200.7_4.4_1994	1
Thallium	EPA 200.7_4.4_1994	1
Tin	EPA 200.7_4.4_1994	1
Titanium	EPA 200.7_4.4_1994	1
Vanadium	EPA 200.7_4.4_1994	1
Zinc	EPA 200.7_4.4_1994	1
Aluminum	EPA 200.8_5.4_1994	1
Antimony	EPA 200.8_5.4_1994	1
Arsenic	EPA 200.8_5.4_1994	1
Barium	EPA 200.8_5.4_1994	1
Beryllium	EPA 200.8_5.4_1994	1
Cadmium	EPA 200.8_5.4_1994	1
Calcium	EPA 200.8_5.4_1994	1
Chromium	EPA 200.8_5.4_1994	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Cobalt	EPA 200.8_5.4_1994	1
Copper	EPA 200.8_5.4_1994	1
Iron	EPA 200.8_5.4_1994	1
Lead	EPA 200.8_5.4_1994	1
Magnesium	EPA 200.8_5.4_1994	1
Manganese	EPA 200.8_5.4_1994	1
Molybdenum	EPA 200.8_5.4_1994	1
Nickel	EPA 200.8_5.4_1994	1
Potassium	EPA 200.8_5.4_1994	1
Selenium	EPA 200.8_5.4_1994	1
Silver	EPA 200.8_5.4_1994	1
Sodium	EPA 200.8_5.4_1994	1
Strontium	EPA 200.8_5.4_1994	1
Thallium	EPA 200.8_5.4_1994	1
Tin	EPA 200.8_5.4_1994	1
Titanium	EPA 200.8_5.4_1994	1
Uranium	EPA 200.8_5.4_1994	1
Vanadium	EPA 200.8_5.4_1994	1
Zinc	EPA 200.8_5.4_1994	1
Mercury	EPA 245.1_3_1994	1
4,4'-DDD	EPA 608.3	1
4,4'-DDE	EPA 608.3	1
4,4'-DDT	EPA 608.3	1
Aldrin	EPA 608.3	1
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 608.3	1
alpha-Chlordane	EPA 608.3	1
Aroclor-1016 (PCB-1016)	EPA 608.3	1
Aroclor-1221 (PCB-1221)	EPA 608.3	1
Aroclor-1232 (PCB-1232)	EPA 608.3	1
Aroclor-1242 (PCB-1242)	EPA 608.3	1
Aroclor-1248 (PCB-1248)	EPA 608.3	1
Aroclor-1254 (PCB-1254)	EPA 608.3	1
Aroclor-1260 (PCB-1260)	EPA 608.3	1
beta-BHC (beta-Hexachlorocyclohexane)	EPA 608.3	1
Chlordane (tech.)	EPA 608.3	1
delta-BHC	EPA 608.3	1
Dieldrin	EPA 608.3	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Endosulfan I	EPA 608.3	1
Endosulfan II	EPA 608.3	1
Endosulfan sulfate	EPA 608.3	1
Endrin	EPA 608.3	1
Endrin aldehyde	EPA 608.3	1
Endrin ketone	EPA 608.3	1
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 608.3	1
gamma-Chlordane	EPA 608.3	1
Heptachlor	EPA 608.3	1
Heptachlor epoxide	EPA 608.3	1
Methoxychlor	EPA 608.3	1
Mirex	EPA 608.3	1
Toxaphene (Chlorinated camphene)	EPA 608.3	1
2-methylpropane (Isobutane)	EPA RSK-175	1
Acetylene	EPA RSK-175	1
Ethane	EPA RSK-175	1
Ethene	EPA RSK-175	1
Methane	EPA RSK-175	1
n-Butane	EPA RSK-175	1
n-Propane	EPA RSK-175	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613B_1994	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613B_1994	1
1,2,3,4,6,7,8-Hpcdd	EPA 1613B_1994	1
1,2,3,4,6,7,8-Hpcdf	EPA 1613B_1994	1
1,2,3,4,7,8,9-Hpcdf	EPA 1613B_1994	1
1,2,3,4,7,8-Hxcdd	EPA 1613B_1994	1
1,2,3,4,7,8-Hxcdf	EPA 1613B_1994	1
1,2,3,6,7,8-Hxcdd	EPA 1613B_1994	1
1,2,3,6,7,8-Hxcdf	EPA 1613B_1994	1
1,2,3,7,8,9-Hxcdd	EPA 1613B_1994	1
1,2,3,7,8,9-Hxcdf	EPA 1613B_1994	1
1,2,3,7,8-Pecdd	EPA 1613B_1994	1
1,2,3,7,8-Pecdf	EPA 1613B_1994	1
2,3,4,6,7,8-Hxcdf	EPA 1613B_1994	1
2,3,4,7,8-Pecdf	EPA 1613B_1994	1
2,3,7,8-TCDD	EPA 1613B_1994	1
2,3,7,8-TCDF	EPA 1613B_1994	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Hpcdd, total	EPA 1613B_1994	1
Hpcdf, total	EPA 1613B_1994	1
Hxcdd, total	EPA 1613B_1994	1
Hxcdf, total	EPA 1613B_1994	1
Pecdd, total	EPA 1613B_1994	1
Pecdf, total	EPA 1613B_1994	1
TCDD, total	EPA 1613B_1994	1
TCDF, total	EPA 1613B_1994	1
4-Methyl-2-pentanone (MIBK)	EPA 1666A_1998	1,4
Ethyl acetate	EPA 1666A_1998	1,4
Isobutyraldehyde	EPA 1666A_1998	1,4
Isopropyl acetate	EPA 1666A_1998	1,4
Isopropyl alcohol (2-Propanol, Isopropanol)	EPA 1666A_1998	1,4
Isopropyl ether	EPA 1666A_1998	1,4
Methyl formate	EPA 1666A_1998	1,4
n-Amyl acetate	EPA 1666A_1998	1,4
n-Amyl alcohol	EPA 1666A_1998	1,4
n-Butyl-acetate	EPA 1666A_1998	1,4
n-Heptane	EPA 1666A_1998	1,4
n-Hexane	EPA 1666A_1998	1,4
tert-Butyl alcohol	EPA 1666A_1998	1,4
Tetrahydrofuran (THF)	EPA 1666A_1998	1,4
Xylene (total)	EPA 1666A_1998	1,4
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	EPA 1668C_2010	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)	EPA 1668C_2010	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	EPA 1668C_2010	1
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)	EPA 1668C_2010	1
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)	EPA 1668C_2010	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)	EPA 1668C_2010	1
2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)	EPA 1668C_2010	1
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)	EPA 1668C_2010	1
2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)	EPA 1668C_2010	1
2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)	EPA 1668C_2010	1
2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)	EPA 1668C_2010	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)	EPA 1668C_2010	1
2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)	EPA 1668C_2010	1
2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)	EPA 1668C_2010	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)	EPA 1668C_2010	1
2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)	EPA 1668C_2010	1
2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)	EPA 1668C_2010	1
2,2',3,3',4-Pentachlorobiphenyl (BZ-82)	EPA 1668C_2010	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)	EPA 1668C_2010	1
2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)	EPA 1668C_2010	1
2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)	EPA 1668C_2010	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)	EPA 1668C_2010	1
2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)	EPA 1668C_2010	1
2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)	EPA 1668C_2010	1
2,2',3,3',5-Pentachlorobiphenyl (BZ-83)	EPA 1668C_2010	1
2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)	EPA 1668C_2010	1
2,2',3,3',6-Pentachlorobiphenyl (BZ-84)	EPA 1668C_2010	1
2,2',3,3'-Tetrachlorobiphenyl (BZ-40)	EPA 1668C_2010	1
2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)	EPA 1668C_2010	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	EPA 1668C_2010	1
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)	EPA 1668C_2010	1
2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)	EPA 1668C_2010	1
2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)	EPA 1668C_2010	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	EPA 1668C_2010	1
2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)	EPA 1668C_2010	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	EPA 1668C_2010	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)	EPA 1668C_2010	1
2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)	EPA 1668C_2010	1
2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)	EPA 1668C_2010	1
2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)	EPA 1668C_2010	1
2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)	EPA 1668C_2010	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	EPA 1668C_2010	1
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	EPA 1668C_2010	1
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)	EPA 1668C_2010	1

Matrix/Analyte	**Method**	**Notes**
Non-Potable Water		
2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)	EPA 1668C_2010	1
2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)	EPA 1668C_2010	1
2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)	EPA 1668C_2010	1
2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)	EPA 1668C_2010	1
2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)	EPA 1668C_2010	1
2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)	EPA 1668C_2010	1
2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)	EPA 1668C_2010	1
2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)	EPA 1668C_2010	1
2,2',3,4,5-Pentachlorobiphenyl (BZ-86)	EPA 1668C_2010	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	EPA 1668C_2010	1
2,2',3,4',5-Pentachlorobiphenyl (BZ-90)	EPA 1668C_2010	1
2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)	EPA 1668C_2010	1
2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)	EPA 1668C_2010	1
2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)	EPA 1668C_2010	1
2,2',3,4,6-Pentachlorobiphenyl (BZ-88)	EPA 1668C_2010	1
2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)	EPA 1668C_2010	1
2,2',3,4',6-Pentachlorobiphenyl (BZ-91)	EPA 1668C_2010	1
2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)	EPA 1668C_2010	1
2,2',3,4-Tetrachlorobiphenyl (BZ-41)	EPA 1668C_2010	1
2,2',3,4'-Tetrachlorobiphenyl (BZ-42)	EPA 1668C_2010	1
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	EPA 1668C_2010	1
2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)	EPA 1668C_2010	1
2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)	EPA 1668C_2010	1
2,2',3,5,6-Pentachlorobiphenyl (BZ-93)	EPA 1668C_2010	1
2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)	EPA 1668C_2010	1
2,2',3,5',6-Pentachlorobiphenyl (BZ-95)	EPA 1668C_2010	1
2,2',3,5-Tetrachlorobiphenyl (BZ-43)	EPA 1668C_2010	1
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	EPA 1668C_2010	1
2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)	EPA 1668C_2010	1
2,2',3,6-Tetrachlorobiphenyl (BZ-45)	EPA 1668C_2010	1
2,2',3,6'-Tetrachlorobiphenyl (BZ-46)	EPA 1668C_2010	1
2,2',3-Trichlorobiphenyl (BZ-16)	EPA 1668C_2010	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	EPA 1668C_2010	1
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)	EPA 1668C_2010	1
2,2',4,4',5-Pentachlorobiphenyl (BZ-99)	EPA 1668C_2010	1
2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)	EPA 1668C_2010	1
2,2',4,4',6-Pentachlorobiphenyl (BZ-100)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,2',4,4'-Tetrachlorobiphenyl (BZ-47)	EPA 1668C_2010	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	EPA 1668C_2010	1
2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)	EPA 1668C_2010	1
2,2',4,5',6-Pentachlorobiphenyl (BZ-103)	EPA 1668C_2010	1
2,2',4,5-Tetrachlorobiphenyl (BZ-48)	EPA 1668C_2010	1
2,2',4,5'-Tetrachlorobiphenyl (BZ-49)	EPA 1668C_2010	1
2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)	EPA 1668C_2010	1
2,2',4,6-Tetrachlorobiphenyl (BZ-50)	EPA 1668C_2010	1
2,2',4,6'-Tetrachlorobiphenyl (BZ-51)	EPA 1668C_2010	1
2,2',4-Trichlorobiphenyl (BZ-17)	EPA 1668C_2010	1
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	EPA 1668C_2010	1
2,2',5,6'-Tetrachlorobiphenyl (BZ-53)	EPA 1668C_2010	1
2,2',5-Trichlorobiphenyl (BZ-18)	EPA 1668C_2010	1
2,2',6,6'-Tetrachlorobiphenyl (BZ-54)	EPA 1668C_2010	1
2,2',6-Trichlorobiphenyl (BZ-19)	EPA 1668C_2010	1
2,2'-Dichlorobiphenyl (BZ-4)	EPA 1668C_2010	1
2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)	EPA 1668C_2010	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)	EPA 1668C_2010	1
2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)	EPA 1668C_2010	1
2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)	EPA 1668C_2010	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)	EPA 1668C_2010	1
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)	EPA 1668C_2010	1
2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)	EPA 1668C_2010	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)	EPA 1668C_2010	1
2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)	EPA 1668C_2010	1
2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)	EPA 1668C_2010	1
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	EPA 1668C_2010	1
2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)	EPA 1668C_2010	1
2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)	EPA 1668C_2010	1
2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)	EPA 1668C_2010	1
2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)	EPA 1668C_2010	1
2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)	EPA 1668C_2010	1
2,3,3',4,5-Pentachlorobiphenyl (BZ-106)	EPA 1668C_2010	1
2,3,3',4',5-Pentachlorobiphenyl (BZ-107)	EPA 1668C_2010	1
2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)	EPA 1668C_2010	1
2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)	EPA 1668C_2010	1
2,3,3',4,6-Pentachlorobiphenyl (BZ-109)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	EPA 1668C_2010	1
2,3,3',4-Tetrachlorobiphenyl (BZ-55)	EPA 1668C_2010	1
2,3,3',4'-Tetrachlorobiphenyl (BZ-56)	EPA 1668C_2010	1
2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)	EPA 1668C_2010	1
2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)	EPA 1668C_2010	1
2,3,3',5,6-Pentachlorobiphenyl (BZ-112)	EPA 1668C_2010	1
2,3,3',5',6-Pentachlorobiphenyl (BZ-113)	EPA 1668C_2010	1
2,3,3',5-Tetrachlorobiphenyl (BZ-57)	EPA 1668C_2010	1
2,3,3',5'-Tetrachlorobiphenyl (BZ-58)	EPA 1668C_2010	1
2,3,3',6-Tetrachlorobiphenyl (BZ-59)	EPA 1668C_2010	1
2,3,3'-Trichlorobiphenyl (BZ-20)	EPA 1668C_2010	1
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)	EPA 1668C_2010	1
2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)	EPA 1668C_2010	1
2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)	EPA 1668C_2010	1
2,3,4,4',5-Pentachlorobiphenyl (BZ-114)	EPA 1668C_2010	1
2,3',4,4',5-Pentachlorobiphenyl (BZ-118)	EPA 1668C_2010	1
2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)	EPA 1668C_2010	1
2,3,4,4',6-Pentachlorobiphenyl (BZ-115)	EPA 1668C_2010	1
2,3',4,4',6-Pentachlorobiphenyl (BZ-119)	EPA 1668C_2010	1
2,3,4,4'-Tetrachlorobiphenyl (BZ-60)	EPA 1668C_2010	1
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	EPA 1668C_2010	1
2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)	EPA 1668C_2010	1
2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)	EPA 1668C_2010	1
2,3,4,5,6-Pentachlorobiphenyl (BZ-116)	EPA 1668C_2010	1
2,3,4',5,6-Pentachlorobiphenyl (BZ-117)	EPA 1668C_2010	1
2,3',4,5',6-Pentachlorobiphenyl (BZ-121)	EPA 1668C_2010	1
2,3',4',5',6-Pentachlorobiphenyl (BZ-125)	EPA 1668C_2010	1
2,3,4,5-Tetrachlorobiphenyl (BZ-61)	EPA 1668C_2010	1
2,3,4',5-Tetrachlorobiphenyl (BZ-63)	EPA 1668C_2010	1
2,3',4,5'-Tetrachlorobiphenyl (BZ-68)	EPA 1668C_2010	1
2,3',4',5-Tetrachlorobiphenyl (BZ-70)	EPA 1668C_2010	1
2,3',4',5'-Tetrachlorobiphenyl (BZ-76)	EPA 1668C_2010	1
2,3',4,5-Tetrachlorobiphenyl (BZ-67)	EPA 1668C_2010	1
2,3,4,6-Tetrachlorobiphenyl (BZ-62)	EPA 1668C_2010	1
2,3,4',6-Tetrachlorobiphenyl (BZ-64)	EPA 1668C_2010	1
2,3',4,6-Tetrachlorobiphenyl (BZ-69)	EPA 1668C_2010	1
2,3',4',6-Tetrachlorobiphenyl (BZ-71)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,3,4-Trichlorobiphenyl (BZ-21)	EPA 1668C_2010	1
2,3,4'-Trichlorobiphenyl (BZ-22)	EPA 1668C_2010	1
2,3',4-Trichlorobiphenyl (BZ-25)	EPA 1668C_2010	1
2,3',4'-Trichlorobiphenyl (BZ-33)	EPA 1668C_2010	1
2,3',5,5'-Tetrachlorobiphenyl (BZ-72)	EPA 1668C_2010	1
2,3,5,6-Tetrachlorobiphenyl (BZ-65)	EPA 1668C_2010	1
2,3',5',6-Tetrachlorobiphenyl (BZ-73)	EPA 1668C_2010	1
2,3,5-Trichlorobiphenyl (BZ-23)	EPA 1668C_2010	1
2,3',5-Trichlorobiphenyl (BZ-26)	EPA 1668C_2010	1
2,3',5'-Trichlorobiphenyl (BZ-34)	EPA 1668C_2010	1
2,3,6-Trichlorobiphenyl (BZ-24)	EPA 1668C_2010	1
2,3',6-Trichlorobiphenyl (BZ-27)	EPA 1668C_2010	1
2,3-Dichlorobiphenyl (BZ-5)	EPA 1668C_2010	1
2,3'-Dichlorobiphenyl (BZ-6)	EPA 1668C_2010	1
2,4,4',5-Tetrachlorobiphenyl (BZ-74)	EPA 1668C_2010	1
2,4,4',6-Tetrachlorobiphenyl (BZ-75)	EPA 1668C_2010	1
2,4,4'-Trichlorobiphenyl (BZ-28)	EPA 1668C_2010	1
2,4,5-Trichlorobiphenyl (BZ-29)	EPA 1668C_2010	1
2,4',5-Trichlorobiphenyl (BZ-31)	EPA 1668C_2010	1
2,4,6-Trichlorobiphenyl (BZ-30)	EPA 1668C_2010	1
2,4',6-Trichlorobiphenyl (BZ-32)	EPA 1668C_2010	1
2,4-Dichlorobiphenyl (BZ-7)	EPA 1668C_2010	1
2,4'-Dichlorobiphenyl (BZ-8)	EPA 1668C_2010	1
2,5-Dichlorobiphenyl (BZ-9)	EPA 1668C_2010	1
2,6-Dichlorobiphenyl (BZ-10)	EPA 1668C_2010	1
2-Chlorobiphenyl (BZ-1)	EPA 1668C_2010	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)	EPA 1668C_2010	1
3,3',4,4',5-Pentachlorobiphenyl (BZ-126)	EPA 1668C_2010	1
3,3',4,4'-Tetrachlorobiphenyl (BZ-77)	EPA 1668C_2010	1
3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)	EPA 1668C_2010	1
3,3',4,5-Tetrachlorobiphenyl (BZ-78)	EPA 1668C_2010	1
3,3',4,5'-Tetrachlorobiphenyl (BZ-79)	EPA 1668C_2010	1
3,3',4-Trichlorobiphenyl (BZ-35)	EPA 1668C_2010	1
3,3',5,5'-Tetrachlorobiphenyl (BZ-80)	EPA 1668C_2010	1
3,3',5-Trichlorobiphenyl (BZ-36)	EPA 1668C_2010	1
3,3'-Dichlorobiphenyl (BZ-11)	EPA 1668C_2010	1
3,4,4',5-Tetrachlorobiphenyl (BZ-81)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
3,4,4'-Trichlorobiphenyl (BZ-37)	EPA 1668C_2010	1
3,4,5-Trichlorobiphenyl (BZ-38)	EPA 1668C_2010	1
3,4',5-Trichlorobiphenyl (BZ-39)	EPA 1668C_2010	1
3,4-Dichlorobiphenyl (BZ-12)	EPA 1668C_2010	1
3,4'-Dichlorobiphenyl (BZ-13)	EPA 1668C_2010	1
3,5-Dichlorobiphenyl (BZ-14)	EPA 1668C_2010	1
3-Chlorobiphenyl (BZ-2)	EPA 1668C_2010	1
4,4'-Dichlorobiphenyl (BZ-15)	EPA 1668C_2010	1
4-Chlorobiphenyl (BZ-3)	EPA 1668C_2010	1
Coelution - Dichlorobiphenyls (BZ-12-+13)	EPA 1668C_2010	1,9
Coelution - Heptachlorobiphenyls (BZ-171 + BZ-173)	EPA 1668C_2010	1,9
Coelution - Heptachlorobiphenyls (BZ-180 + BZ-193)	EPA 1668C_2010	1,9
Coelution - Heptachlorobiphenyls (BZ-183 + BZ-185)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-128 + BZ-166)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-129 + BZ138 + BZ-163)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-135 + BZ-151)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-139 + BZ-140)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-147 + BZ-149)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-153 + BZ-168)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-156 + BZ-157)	EPA 1668C_2010	1,9
Coelution - Octachlorobiphenyls (BZ-197 + BZ-200)	EPA 1668C_2010	1,9
Coelution - Octachlorobiphenyls (BZ-198 + BZ-199)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-108 + BZ-124)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-110 + BZ-115)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-97 + BZ-109 + BZ-119 + BZ-125)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-93 + BZ-100)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-98 + BZ-102)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-40 + BZ-71)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-49 + BZ-69)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-50 + BZ-53)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-18 + BZ-30)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-20 + BZ-28)	EPA 1668C_2010	1,9

Matrix/Analyte	Method	Notes
Non-Potable Water		
Coelution - Trichlorobiphenyls (BZ-21 + BZ-33)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-26 + BZ-29)	EPA 1668C_2010	1,9
Decachlorobiphenyl (BZ-209)	EPA 1668C_2010	1
PCBs, as congeners	EPA 1668C_2010	1,9
Total Dichlorobiphenyls	EPA 1668C_2010	1,9
Total Heptachlorobiphenyls	EPA 1668C_2010	1,9
Total Hexachlorobiphenyls	EPA 1668C_2010	1,9
Total Monochlorobiphenyls	EPA 1668C_2010	1,9
Total Nonachlorobiphenyls	EPA 1668C_2010	1,9
Total Octachlorobiphenyls	EPA 1668C_2010	1,9
Total Pentachlorobiphenyls	EPA 1668C_2010	1,9
Total Tetrachlorobiphenyls	EPA 1668C_2010	1,9
Total Trichlorobiphenyls	EPA 1668C_2010	1,9
1,1,1,2-Tetrachloroethane	EPA 624.1	1
1,1,1-Trichloro-2,2,2-trifluoroethane	EPA 624.1	1
1,1,1-Trichloroethane	EPA 624.1	1
1,1,2,2-Tetrachloroethane	EPA 624.1	1
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA 624.1	1
1,1,2-Trichloroethane	EPA 624.1	1
1,1-Dichloroethane	EPA 624.1	1
1,1-Dichloroethylene	EPA 624.1	1
1,1-Dichloropropene	EPA 624.1	1
1,2,3-Trichlorobenzene	EPA 624.1	1
1,2,3-Trichloropropane	EPA 624.1	1
1,2,4-Trimethylbenzene	EPA 624.1	1
1,2-Dibromo-3-chloropropane (DBCP)	EPA 624.1	1
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 624.1	1
1,2-Dichlorobenzene	EPA 624.1	1
1,2-Dichloroethane (Ethylene dichloride)	EPA 624.1	1
1,2-Dichloropropane	EPA 624.1	1
1,3,5-Trimethylbenzene	EPA 624.1	1
1,3-Dichlorobenzene	EPA 624.1	1
1,3-Dichloropropane	EPA 624.1	1
1,4-Dichlorobenzene	EPA 624.1	1
2,2-Dichloropropane	EPA 624.1	1
2-Butanone (Methyl ethyl ketone, MEK)	EPA 624.1	1
2-Chloro-1,3-butadiene (Chloroprene)	EPA 624.1	1

Matrix/Analyte	**Method**	**Notes**
Non-Potable Water		
2-Chloroethyl vinyl ether	EPA 624.1	1
2-Chlorotoluene	EPA 624.1	1
2-Hexanone	EPA 624.1	1
2-Propanol	EPA 624.1	1
4-Chlorotoluene	EPA 624.1	1
4-Isopropyltoluene (p-Cymene)	EPA 624.1	1
4-Methyl-2-pentanone (MIBK)	EPA 624.1	1
Acetone	EPA 624.1	1
Acetonitrile	EPA 624.1	1
Acrolein (Propenal)	EPA 624.1	1
Acrylonitrile	EPA 624.1	1
Benzene	EPA 624.1	1
Bromobenzene	EPA 624.1	1
Bromochloromethane	EPA 624.1	1
Bromodichloromethane	EPA 624.1	1
Bromoform	EPA 624.1	1
Carbon disulfide	EPA 624.1	1
Carbon tetrachloride	EPA 624.1	1
Chlorobenzene	EPA 624.1	1
Chlorodibromomethane	EPA 624.1	1
Chloroethane (Ethyl chloride)	EPA 624.1	1
Chloroform	EPA 624.1	1
cis-1,2-Dichloroethylene	EPA 624.1	1
cis-1,3-Dichloropropene	EPA 624.1	1
cis-1,4-Dichloro-2-butene	EPA 624.1	1
Cyclohexane	EPA 624.1	1
Dibromomethane	EPA 624.1	1
Dichlorodifluoromethane (Freon-12)	EPA 624.1	1
Dichlorofluoromethane (Freon 21)	EPA 624.1	1
Di-isopropylether (DIPE)	EPA 624.1	1
Ethyl acetate	EPA 624.1	1
Ethyl methacrylate	EPA 624.1	1
Ethylbenzene	EPA 624.1	1
Ethyl-t-butylether (ETBE)	EPA 624.1	1
Hexachlorobutadiene	EPA 624.1	1
Iodomethane (Methyl iodide)	EPA 624.1	1
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 624.1	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Isopropylbenzene	EPA 624.1	1
m+p-xylene	EPA 624.1	1
Methacrylonitrile	EPA 624.1	1
Methyl bromide (Bromomethane)	EPA 624.1	1
Methyl chloride (Chloromethane)	EPA 624.1	1
Methyl methacrylate	EPA 624.1	1
Methyl tert-butyl ether (MTBE)	EPA 624.1	1
Methylene chloride (Dichloromethane)	EPA 624.1	1
n-Butylbenzene	EPA 624.1	1
n-Hexane	EPA 624.1	1
n-Propylbenzene	EPA 624.1	1
o-Xylene	EPA 624.1	1
Propionitrile (Ethyl cyanide)	EPA 624.1	1
sec-Butylbenzene	EPA 624.1	1
Styrene	EPA 624.1	1
tert-amylmethylether (TAME)	EPA 624.1	1
tert-Butyl alcohol	EPA 624.1	1
tert-Butylbenzene	EPA 624.1	1
Tetrachloroethylene (Perchloroethylene)	EPA 624.1	1
Tetrahydrofuran (THF)	EPA 624.1	1
Toluene	EPA 624.1	1
trans-1,2-Dichloroethylene	EPA 624.1	1
trans-1,3-Dichloropropylene	EPA 624.1	1
trans-1,4-Dichloro-2-butene	EPA 624.1	1
Trichloroethene (Trichloroethylene)	EPA 624.1	1
Trichlorofluoromethane (Freon 11)	EPA 624.1	1
Vinyl acetate	EPA 624.1	1
Vinyl chloride	EPA 624.1	1
Xylene (total)	EPA 624.1	1
1,1'-Biphenyl (BZ-0)	EPA 625.1	1
1,2,4,5-Tetrachlorobenzene	EPA 625.1	1
1,2,4-Trichlorobenzene	EPA 625.1	1
1,2-Diphenylhydrazine	EPA 625.1	1
1-Methylnaphthalene	EPA 625.1	1
2,2'-Oxybis(1-chloropropane)	EPA 625.1	1
2,3,4,6-Tetrachlorophenol	EPA 625.1	1
2,3-Dichloroaniline	EPA 625.1	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
2,4,5-Trichlorophenol	EPA 625.1	1
2,4,6-Trichlorophenol	EPA 625.1	1
2,4-Dichlorophenol	EPA 625.1	1
2,4-Dimethylphenol	EPA 625.1	1
2,4-Dinitrophenol	EPA 625.1	1
2,4-Dinitrotoluene (2,4-DNT)	EPA 625.1	1
2,6-Dichlorophenol	EPA 625.1	1
2,6-Dinitrotoluene (2,6-DNT)	EPA 625.1	1
2-Chloronaphthalene	EPA 625.1	1
2-Chlorophenol	EPA 625.1	1
2-Methylnaphthalene	EPA 625.1	1
2-Methylphenol (o-Cresol)	EPA 625.1	1
2-Nitroaniline	EPA 625.1	1
2-Nitrophenol	EPA 625.1	1
3,3'-Dichlorobenzidine	EPA 625.1	1
3-Nitroaniline	EPA 625.1	1
4,6-Dinitro-2-methylphenol	EPA 625.1	1
4-Bromophenyl phenyl ether (BDE-3)	EPA 625.1	1
4-Chloro-3-methylphenol	EPA 625.1	1
4-Chloroaniline	EPA 625.1	1
4-Chlorophenyl phenylether	EPA 625.1	1
4-Nitroaniline	EPA 625.1	1
4-Nitrophenol	EPA 625.1	1
Acenaphthene	EPA 625.1	1
Acenaphthylene	EPA 625.1	1
Acetophenone	EPA 625.1	1
alpha-Terpineol	EPA 625.1	1
Aniline	EPA 625.1	1
Anthracene	EPA 625.1	1
Benzidine	EPA 625.1	1
Benzo(a)anthracene	EPA 625.1	1
Benzo(a)pyrene	EPA 625.1	1
Benzo(g,h,i)perylene	EPA 625.1	1
Benzo(k)fluoranthene	EPA 625.1	1
Benzo[b]fluoranthene	EPA 625.1	1
Benzoic acid	EPA 625.1	1
Benzyl alcohol	EPA 625.1	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Biphenyl	EPA 625.1	1
bis(2-Chloroethoxy)methane	EPA 625.1	1
bis(2-Chloroethyl) ether	EPA 625.1	1
bis(2-Chloroisopropyl) ether	EPA 625.1	1
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 625.1	1
Butyl benzyl phthalate	EPA 625.1	1
Carbazole	EPA 625.1	1
Chrysene	EPA 625.1	1
Dibenz(a,h) anthracene	EPA 625.1	1
Dibenzofuran	EPA 625.1	1
Diethyl phthalate	EPA 625.1	1
Dimethyl phthalate	EPA 625.1	1
Di-n-butyl phthalate	EPA 625.1	1
Di-n-octyl phthalate	EPA 625.1	1
Fluoranthene	EPA 625.1	1
Fluorene	EPA 625.1	1
Hexachlorobenzene	EPA 625.1	1
Hexachlorobutadiene	EPA 625.1	1
Hexachlorocyclopentadiene	EPA 625.1	1
Hexachloroethane	EPA 625.1	1
Indeno(1,2,3-cd) pyrene	EPA 625.1	1
Isophorone	EPA 625.1	1
m+p Cresol	EPA 625.1	1
Naphthalene	EPA 625.1	1
n-Decane	EPA 625.1	1
n-Docosane	EPA 625.1	1
n-Eicosane	EPA 625.1	1
n-Hexadecane	EPA 625.1	1
Nitrobenzene	EPA 625.1	1
N-Nitrosodiethylamine	EPA 625.1	1
N-Nitrosodimethylamine	EPA 625.1	1
N-Nitroso-di-n-butylamine	EPA 625.1	1
N-Nitroso-di-n-propylamine	EPA 625.1	1
N-Nitrosodiphenylamine	EPA 625.1	1
N-Nitrosopyrrolidine	EPA 625.1	1
n-Octadecane	EPA 625.1	1
n-Tetradecane	EPA 625.1	1

Matrix/Analyte	Method	Notes
Non-Potable Water		
Pentachlorobenzene	EPA 625.1	1
Pentachlorophenol	EPA 625.1	1
Phenanthrene	EPA 625.1	1
Phenol	EPA 625.1	1
Pyrene	EPA 625.1	1
Pyridine	EPA 625.1	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	SOP-T-PFAS-WI14355	1,8
1H,1H,2H,2H,-Perfluorodecanesulfonic acid (8:2 FTS)	SOP-T-PFAS-WI14355	1,8
1H,1H,2H,2H,-Perfluorooctansulfonic acid (6:2 FTS)	SOP-T-PFAS-WI14355	1,8
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2-FTS)	SOP-T-PFAS-WI14355	1,8
1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	SOP-T-PFAS-WI14355	1,8
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	SOP-T-PFAS-WI14355	1,8
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	SOP-T-PFAS-WI14355	1,8
N-Ethylperfluorooctane sulfonamide (EtFOSA)	SOP-T-PFAS-WI14355	1,8
N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	SOP-T-PFAS-WI14355	1,8
N-Ethylperfluorooctanesulfonamidoethanol (EtFOSE)	SOP-T-PFAS-WI14355	1,8
N-Methylperfluorooctane sulfonamide (MeFOSA)	SOP-T-PFAS-WI14355	1,8
N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	SOP-T-PFAS-WI14355	1,8
N-Methylperfluorooctanesulfonamidoethanol (MeFOSE)	SOP-T-PFAS-WI14355	1,8
Perfluorobutane sulfonic acid (PFBS)	SOP-T-PFAS-WI14355	1,8
Perfluorobutyric acid (PFBA)	SOP-T-PFAS-WI14355	1,8
Perfluorodecane sulfuric acid (PFDS)	SOP-T-PFAS-WI14355	1,8
Perfluorodecanoic acid (PFDA)	SOP-T-PFAS-WI14355	1,8
Perfluorododecane sulfonic acid (PFDoS)	SOP-T-PFAS-WI14355	1,8
Perfluorododecanoic acid (PFDoA)	SOP-T-PFAS-WI14355	1,8
Perfluoroheptane sulfonic acid (PFHpS)	SOP-T-PFAS-WI14355	1,8
Perfluoroheptanoic acid (PFHpA)	SOP-T-PFAS-WI14355	1,8
Perfluorohexadecanoic acid (PFHXDA)	SOP-T-PFAS-WI14355	1,8
Perfluorohexane sulfonic acid (PFHxS)	SOP-T-PFAS-WI14355	1,8
Perfluorohexanoic acid (PFHxA)	SOP-T-PFAS-WI14355	1,8
Perfluorononane sulfonic acid (PFNS)	SOP-T-PFAS-WI14355	1,8
Perfluorononanoic acid (PFNA)	SOP-T-PFAS-WI14355	1,8
Perfluorooctadecanoic acid (PFODA)	SOP-T-PFAS-WI14355	1,8
Perfluorooctane sulfonamide (PFOSA)	SOP-T-PFAS-WI14355	1,8
Perfluorooctane sulfonic acid (PFOS)	SOP-T-PFAS-WI14355	1,8
Perfluorooctanoic acid (PFOA)	SOP-T-PFAS-WI14355	1,8
Perfluoropentane sulfonic acid (PFPeS)	SOP-T-PFAS-WI14355	1,8

Matrix/Analyte	Method	Notes
Non-Potable Water		
Perfluoropentanoic acid (PFPeA)	SOP-T-PFAS-WI14355	1,8
Perfluorotetradecanoic acid (PFTeDA)	SOP-T-PFAS-WI14355	1,8
Perfluorotridecanoic acid (PFTrDA)	SOP-T-PFAS-WI14355	1,8
Perfluoroundecanoic acid (PFUnA)	SOP-T-PFAS-WI14355	1,8
Solid and Chemical Materials		
Chloride	EPA 300.0_2.1_1993	1
Fluoride	EPA 300.0_2.1_1993	1
Nitrate	EPA 300.0_2.1_1993	1
Nitrite	EPA 300.0_2.1_1993	1
Sulfate	EPA 300.0_2.1_1993	1
Chromium, Hexavalent	EPA 7196A_1_1992	1
Chromium, Hexavalent	EPA 7199_0_(12/96)	1
Cyanide, Total	EPA 9012 B-04	1
pH	EPA 9045D_2002	1
Specific Conductance	EPA 9050A_1_1996	1,5
Total Organic Carbon	Lloyd Kahn	1
Ammonia	SM 4500-NH3 C-2011	1
Aluminum	EPA 6010D_(7/14)	1
Antimony	EPA 6010D_(7/14)	1
Arsenic	EPA 6010D_(7/14)	1
Barium	EPA 6010D_(7/14)	1
Beryllium	EPA 6010D_(7/14)	1
Boron	EPA 6010D_(7/14)	1
Cadmium	EPA 6010D_(7/14)	1
Calcium	EPA 6010D_(7/14)	1
Chromium	EPA 6010D_(7/14)	1
Cobalt	EPA 6010D_(7/14)	1
Copper	EPA 6010D_(7/14)	1
Iron	EPA 6010D_(7/14)	1
Lead	EPA 6010D_(7/14)	1
Lithium	EPA 6010D_(7/14)	1
Magnesium	EPA 6010D_(7/14)	1
Manganese	EPA 6010D_(7/14)	1
Molybdenum	EPA 6010D_(7/14)	1
Nickel	EPA 6010D_(7/14)	1
Potassium	EPA 6010D_(7/14)	1
Selenium	EPA 6010D_(7/14)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Silver	EPA 6010D_(7/14)	1
Sodium	EPA 6010D_(7/14)	1
Strontium	EPA 6010D_(7/14)	1
Sulfur	EPA 6010D_(7/14)	1
Thallium	EPA 6010D_(7/14)	1
Thorium	EPA 6010D_(7/14)	1
Tin	EPA 6010D_(7/14)	1,3
Titanium	EPA 6010D_(7/14)	1,3
Tungsten	EPA 6010D_(7/14)	1
Vanadium	EPA 6010D_(7/14)	1
Zinc	EPA 6010D_(7/14)	1
Zirconium	EPA 6010D_(7/14)	1
Aluminum	EPA 6020B_(7/14)	1
Antimony	EPA 6020B_(7/14)	1
Arsenic	EPA 6020B_(7/14)	1
Barium	EPA 6020B_(7/14)	1
Beryllium	EPA 6020B_(7/14)	1
Cadmium	EPA 6020B_(7/14)	1
Calcium	EPA 6020B_(7/14)	1
Chromium	EPA 6020B_(7/14)	1
Cobalt	EPA 6020B_(7/14)	1
Copper	EPA 6020B_(7/14)	1
Iron	EPA 6020B_(7/14)	1
Lead	EPA 6020B_(7/14)	1
Magnesium	EPA 6020B_(7/14)	1
Manganese	EPA 6020B_(7/14)	1
Molybdenum	EPA 6020B_(7/14)	1
Nickel	EPA 6020B_(7/14)	1
Potassium	EPA 6020B_(7/14)	1
Selenium	EPA 6020B_(7/14)	1
Silver	EPA 6020B_(7/14)	1
Sodium	EPA 6020B_(7/14)	1
Strontium	EPA 6020B_(7/14)	1
Thallium	EPA 6020B_(7/14)	1
Tin	EPA 6020B_(7/14)	1
Titanium	EPA 6020B_(7/14)	1
Uranium	EPA 6020B_(7/14)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Vanadium	EPA 6020B_(7/14)	1
Zinc	EPA 6020B_(7/14)	1
Mercury	EPA 7471B_(1/98)	1
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8011-92	1
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8011-92	1
Diesel range organics (DRO)	EPA 8015D_4_(6/03)	1
Ethanol	EPA 8015D_4_(6/03)	1
Ethylene glycol	EPA 8015D_4_(6/03)	1
Gasoline range organics (GRO)	EPA 8015D_4_(6/03)	1
Isopropyl alcohol (2-Propanol, Isopropanol)	EPA 8015D_4_(6/03)	1
Methanol	EPA 8015D_4_(6/03)	1
2,4'-DDD	EPA 8081B_(2/07)	1
2,4'-DDE	EPA 8081B_(2/07)	1
2,4'-DDT	EPA 8081B_(2/07)	1
4,4'-DDD	EPA 8081B_(2/07)	1
4,4'-DDE	EPA 8081B_(2/07)	1
4,4'-DDT	EPA 8081B_(2/07)	1
Aldrin	EPA 8081B_(2/07)	1
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081B_(2/07)	1
alpha-Chlordane	EPA 8081B_(2/07)	1
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081B_(2/07)	1
Chlordane (tech.)	EPA 8081B_(2/07)	1
delta-BHC	EPA 8081B_(2/07)	1
Dieldrin	EPA 8081B_(2/07)	1
Endosulfan I	EPA 8081B_(2/07)	1
Endosulfan II	EPA 8081B_(2/07)	1
Endosulfan sulfate	EPA 8081B_(2/07)	1
Endrin	EPA 8081B_(2/07)	1
Endrin aldehyde	EPA 8081B_(2/07)	1
Endrin ketone	EPA 8081B_(2/07)	1
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081B_(2/07)	1
gamma-Chlordane	EPA 8081B_(2/07)	1
Heptachlor	EPA 8081B_(2/07)	1
Heptachlor epoxide	EPA 8081B_(2/07)	1
Methoxychlor	EPA 8081B_(2/07)	1
Mirex	EPA 8081B_(2/07)	1
Toxaphene (Chlorinated camphene)	EPA 8081B_(2/07)	1

Matrix/Analyte	**Method**	**Notes**
Solid and Chemical Materials		
Aroclor-1016 (PCB-1016)	EPA 8082A_(2/07)	1
Aroclor-1221 (PCB-1221)	EPA 8082A_(2/07)	1
Aroclor-1232 (PCB-1232)	EPA 8082A_(2/07)	1
Aroclor-1242 (PCB-1242)	EPA 8082A_(2/07)	1
Aroclor-1248 (PCB-1248)	EPA 8082A_(2/07)	1
Aroclor-1254 (PCB-1254)	EPA 8082A_(2/07)	1
Aroclor-1260 (PCB-1260)	EPA 8082A_(2/07)	1
Aroclor-1262 (PCB-1262)	EPA 8082A_(2/07)	1
Aroclor-1268 (PCB-1268)	EPA 8082A_(2/07)	1
2,4,5-T	EPA 8151A_(1/98)	1
2,4-D	EPA 8151A_(1/98)	1
2,4-DB	EPA 8151A_(1/98)	1
Dalapon	EPA 8151A_(1/98)	1
Dicamba	EPA 8151A_(1/98)	1
Dichloroprop (Dichlorprop)	EPA 8151A_(1/98)	1
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151A_(1/98)	1
MCPA	EPA 8151A_(1/98)	1
MCPP	EPA 8151A_(1/98)	1
Pentachlorophenol	EPA 8151A_(1/98)	1
Picloram	EPA 8151A_(1/98)	1
Silvex (2,4,5-TP)	EPA 8151A_(1/98)	1
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330B_(10/06)	1
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330B_(10/06)	1
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330B_(10/06)	1
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330B_(10/06)	1
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330B_(10/06)	1
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330B_(10/06)	1
2-Nitrotoluene	EPA 8330B_(10/06)	1
3,5-Dinitroaniline	EPA 8330B_(10/06)	1
3-Nitrotoluene	EPA 8330B_(10/06)	1
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330B_(10/06)	1
4-Nitrotoluene	EPA 8330B_(10/06)	1
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	EPA 8330B_(10/06)	1
Nitrobenzene	EPA 8330B_(10/06)	1
Nitroglycerin	EPA 8330B_(10/06)	1
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330B_(10/06)	1
Pentaerythritoltetranitrate (PETN)	EPA 8330B_(10/06)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330B_(10/06)	1
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330B_(10/06)	1
Diesel range organics (DRO)	WDOE NWTPH-Dx_(1997)	1,6
Gasoline range organics (GRO)	WDOE NWTPH-Gx_(1997)	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613B_1994	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613B_1994	1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	EPA 1613B_1994	1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	EPA 1613B_1994	1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	EPA 1613B_1994	1
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613B_1994	1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613B_1994	1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613B_1994	1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613B_1994	1
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	EPA 1613B_1994	1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 1613B_1994	1
1,2,3,7,8-Pecdd	EPA 1613B_1994	1
1,2,3,7,8-Pecdf	EPA 1613B_1994	1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 1613B_1994	1
2,3,4,7,8-Pecdf	EPA 1613B_1994	1
2,3,7,8-TCDF	EPA 1613B_1994	1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 1613B_1994	1
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	EPA 1668C_2010	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)	EPA 1668C_2010	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	EPA 1668C_2010	1
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)	EPA 1668C_2010	1
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)	EPA 1668C_2010	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)	EPA 1668C_2010	1
2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)	EPA 1668C_2010	1
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)	EPA 1668C_2010	1
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)	EPA 1668C_2010	1
2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)	EPA 1668C_2010	1

Matrix/Analyte	**Method**	**Notes**
Solid and Chemical Materials		
2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)	EPA 1668C_2010	1
2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)	EPA 1668C_2010	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)	EPA 1668C_2010	1
2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)	EPA 1668C_2010	1
2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)	EPA 1668C_2010	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)	EPA 1668C_2010	1
2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)	EPA 1668C_2010	1
2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)	EPA 1668C_2010	1
2,2',3,3',4-Pentachlorobiphenyl (BZ-82)	EPA 1668C_2010	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)	EPA 1668C_2010	1
2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)	EPA 1668C_2010	1
2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)	EPA 1668C_2010	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)	EPA 1668C_2010	1
2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)	EPA 1668C_2010	1
2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)	EPA 1668C_2010	1
2,2',3,3',5-Pentachlorobiphenyl (BZ-83)	EPA 1668C_2010	1
2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)	EPA 1668C_2010	1
2,2',3,3',6-Pentachlorobiphenyl (BZ-84)	EPA 1668C_2010	1
2,2',3,3'-Tetrachlorobiphenyl (BZ-40)	EPA 1668C_2010	1
2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)	EPA 1668C_2010	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	EPA 1668C_2010	1
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)	EPA 1668C_2010	1
2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)	EPA 1668C_2010	1
2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)	EPA 1668C_2010	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	EPA 1668C_2010	1
2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)	EPA 1668C_2010	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	EPA 1668C_2010	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)	EPA 1668C_2010	1
2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)	EPA 1668C_2010	1
2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)	EPA 1668C_2010	1
2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)	EPA 1668C_2010	1
2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)	EPA 1668C_2010	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	EPA 1668C_2010	1
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	EPA 1668C_2010	1
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)	EPA 1668C_2010	1
2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)	EPA 1668C_2010	1
2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)	EPA 1668C_2010	1
2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)	EPA 1668C_2010	1
2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)	EPA 1668C_2010	1
2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)	EPA 1668C_2010	1
2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)	EPA 1668C_2010	1
2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)	EPA 1668C_2010	1
2,2',3,4,5-Pentachlorobiphenyl (BZ-86)	EPA 1668C_2010	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	EPA 1668C_2010	1
2,2',3,4',5-Pentachlorobiphenyl (BZ-90)	EPA 1668C_2010	1
2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)	EPA 1668C_2010	1
2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)	EPA 1668C_2010	1
2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)	EPA 1668C_2010	1
2,2',3,4,6-Pentachlorobiphenyl (BZ-88)	EPA 1668C_2010	1
2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)	EPA 1668C_2010	1
2,2',3,4',6-Pentachlorobiphenyl (BZ-91)	EPA 1668C_2010	1
2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)	EPA 1668C_2010	1
2,2',3,4-Tetrachlorobiphenyl (BZ-41)	EPA 1668C_2010	1
2,2',3,4'-Tetrachlorobiphenyl (BZ-42)	EPA 1668C_2010	1
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	EPA 1668C_2010	1
2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)	EPA 1668C_2010	1
2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)	EPA 1668C_2010	1
2,2',3,5,6-Pentachlorobiphenyl (BZ-93)	EPA 1668C_2010	1
2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)	EPA 1668C_2010	1
2,2',3,5',6-Pentachlorobiphenyl (BZ-95)	EPA 1668C_2010	1
2,2',3,5-Tetrachlorobiphenyl (BZ-43)	EPA 1668C_2010	1
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	EPA 1668C_2010	1
2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)	EPA 1668C_2010	1
2,2',3,6-Tetrachlorobiphenyl (BZ-45)	EPA 1668C_2010	1
2,2',3,6'-Tetrachlorobiphenyl (BZ-46)	EPA 1668C_2010	1
2,2',3-Trichlorobiphenyl (BZ-16)	EPA 1668C_2010	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	EPA 1668C_2010	1
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)	EPA 1668C_2010	1
2,2',4,4',5-Pentachlorobiphenyl (BZ-99)	EPA 1668C_2010	1
2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)	EPA 1668C_2010	1
2,2',4,4',6-Pentachlorobiphenyl (BZ-100)	EPA 1668C_2010	1
2,2',4,4'-Tetrachlorobiphenyl (BZ-47)	EPA 1668C_2010	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)	EPA 1668C_2010	1
2,2',4,5',6-Pentachlorobiphenyl (BZ-103)	EPA 1668C_2010	1
2,2',4,5-Tetrachlorobiphenyl (BZ-48)	EPA 1668C_2010	1
2,2',4,5'-Tetrachlorobiphenyl (BZ-49)	EPA 1668C_2010	1
2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)	EPA 1668C_2010	1
2,2',4,6-Tetrachlorobiphenyl (BZ-50)	EPA 1668C_2010	1
2,2',4,6'-Tetrachlorobiphenyl (BZ-51)	EPA 1668C_2010	1
2,2',4-Trichlorobiphenyl (BZ-17)	EPA 1668C_2010	1
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	EPA 1668C_2010	1
2,2',5,6'-Tetrachlorobiphenyl (BZ-53)	EPA 1668C_2010	1
2,2',5-Trichlorobiphenyl (BZ-18)	EPA 1668C_2010	1
2,2',6,6'-Tetrachlorobiphenyl (BZ-54)	EPA 1668C_2010	1
2,2',6-Trichlorobiphenyl (BZ-19)	EPA 1668C_2010	1
2,2'-Dichlorobiphenyl (BZ-4)	EPA 1668C_2010	1
2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)	EPA 1668C_2010	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)	EPA 1668C_2010	1
2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)	EPA 1668C_2010	1
2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)	EPA 1668C_2010	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)	EPA 1668C_2010	1
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)	EPA 1668C_2010	1
2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)	EPA 1668C_2010	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)	EPA 1668C_2010	1
2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)	EPA 1668C_2010	1
2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)	EPA 1668C_2010	1
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	EPA 1668C_2010	1
2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)	EPA 1668C_2010	1
2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)	EPA 1668C_2010	1
2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)	EPA 1668C_2010	1
2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)	EPA 1668C_2010	1
2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)	EPA 1668C_2010	1
2,3,3',4,5-Pentachlorobiphenyl (BZ-106)	EPA 1668C_2010	1
2,3,3',4',5-Pentachlorobiphenyl (BZ-107)	EPA 1668C_2010	1
2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)	EPA 1668C_2010	1
2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)	EPA 1668C_2010	1
2,3,3',4,6-Pentachlorobiphenyl (BZ-109)	EPA 1668C_2010	1
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	EPA 1668C_2010	1
2,3,3',4-Tetrachlorobiphenyl (BZ-55)	EPA 1668C_2010	1

Matrix/Analyte	**Method**	**Notes**
Solid and Chemical Materials		
2,3,3',4'-Tetrachlorobiphenyl (BZ-56)	EPA 1668C_2010	1
2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)	EPA 1668C_2010	1
2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)	EPA 1668C_2010	1
2,3,3',5,6-Pentachlorobiphenyl (BZ-112)	EPA 1668C_2010	1
2,3,3',5',6-Pentachlorobiphenyl (BZ-113)	EPA 1668C_2010	1
2,3,3',5-Tetrachlorobiphenyl (BZ-57)	EPA 1668C_2010	1
2,3,3',5'-Tetrachlorobiphenyl (BZ-58)	EPA 1668C_2010	1
2,3,3',6-Tetrachlorobiphenyl (BZ-59)	EPA 1668C_2010	1
2,3,3'-Trichlorobiphenyl (BZ-20)	EPA 1668C_2010	1
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)	EPA 1668C_2010	1
2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)	EPA 1668C_2010	1
2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)	EPA 1668C_2010	1
2,3,4,4',5-Pentachlorobiphenyl (BZ-114)	EPA 1668C_2010	1
2,3',4,4',5-Pentachlorobiphenyl (BZ-118)	EPA 1668C_2010	1
2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)	EPA 1668C_2010	1
2,3,4,4',6-Pentachlorobiphenyl (BZ-115)	EPA 1668C_2010	1
2,3',4,4',6-Pentachlorobiphenyl (BZ-119)	EPA 1668C_2010	1
2,3,4,4'-Tetrachlorobiphenyl (BZ-60)	EPA 1668C_2010	1
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	EPA 1668C_2010	1
2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)	EPA 1668C_2010	1
2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)	EPA 1668C_2010	1
2,3,4,5,6-Pentachlorobiphenyl (BZ-116)	EPA 1668C_2010	1
2,3,4',5,6-Pentachlorobiphenyl (BZ-117)	EPA 1668C_2010	1
2,3',4,5',6-Pentachlorobiphenyl (BZ-121)	EPA 1668C_2010	1
2,3',4',5',6-Pentachlorobiphenyl (BZ-125)	EPA 1668C_2010	1
2,3,4,5-Tetrachlorobiphenyl (BZ-61)	EPA 1668C_2010	1
2,3,4',5-Tetrachlorobiphenyl (BZ-63)	EPA 1668C_2010	1
2,3',4,5'-Tetrachlorobiphenyl (BZ-68)	EPA 1668C_2010	1
2,3',4',5-Tetrachlorobiphenyl (BZ-70)	EPA 1668C_2010	1
2,3',4',5'-Tetrachlorobiphenyl (BZ-76)	EPA 1668C_2010	1
2,3',4,5-Tetrachlorobiphenyl (BZ-67)	EPA 1668C_2010	1
2,3,4,6-Tetrachlorobiphenyl (BZ-62)	EPA 1668C_2010	1
2,3,4',6-Tetrachlorobiphenyl (BZ-64)	EPA 1668C_2010	1
2,3',4,6-Tetrachlorobiphenyl (BZ-69)	EPA 1668C_2010	1
2,3',4',6-Tetrachlorobiphenyl (BZ-71)	EPA 1668C_2010	1
2,3,4-Trichlorobiphenyl (BZ-21)	EPA 1668C_2010	1
2,3,4'-Trichlorobiphenyl (BZ-22)	EPA 1668C_2010	1

Matrix/Analyte	**Method**	**Notes**
Solid and Chemical Materials		
2,3',4-Trichlorobiphenyl (BZ-25)	EPA 1668C_2010	1
2,3',4'-Trichlorobiphenyl (BZ-33)	EPA 1668C_2010	1
2,3',5,5'-Tetrachlorobiphenyl (BZ-72)	EPA 1668C_2010	1
2,3,5,6-Tetrachlorobiphenyl (BZ-65)	EPA 1668C_2010	1
2,3',5',6-Tetrachlorobiphenyl (BZ-73)	EPA 1668C_2010	1
2,3,5-Trichlorobiphenyl (BZ-23)	EPA 1668C_2010	1
2,3',5-Trichlorobiphenyl (BZ-26)	EPA 1668C_2010	1
2,3',5'-Trichlorobiphenyl (BZ-34)	EPA 1668C_2010	1
2,3,6-Trichlorobiphenyl (BZ-24)	EPA 1668C_2010	1
2,3',6-Trichlorobiphenyl (BZ-27)	EPA 1668C_2010	1
2,3-Dichlorobiphenyl (BZ-5)	EPA 1668C_2010	1
2,3'-Dichlorobiphenyl (BZ-6)	EPA 1668C_2010	1
2,4,4',5-Tetrachlorobiphenyl (BZ-74)	EPA 1668C_2010	1
2,4,4',6-Tetrachlorobiphenyl (BZ-75)	EPA 1668C_2010	1
2,4,4'-Trichlorobiphenyl (BZ-28)	EPA 1668C_2010	1
2,4,5-Trichlorobiphenyl (BZ-29)	EPA 1668C_2010	1
2,4',5-Trichlorobiphenyl (BZ-31)	EPA 1668C_2010	1
2,4,6-Trichlorobiphenyl (BZ-30)	EPA 1668C_2010	1
2,4',6-Trichlorobiphenyl (BZ-32)	EPA 1668C_2010	1
2,4-Dichlorobiphenyl (BZ-7)	EPA 1668C_2010	1
2,4'-Dichlorobiphenyl (BZ-8)	EPA 1668C_2010	1
2,5-Dichlorobiphenyl (BZ-9)	EPA 1668C_2010	1
2,6-Dichlorobiphenyl (BZ-10)	EPA 1668C_2010	1
2-Chlorobiphenyl (BZ-1)	EPA 1668C_2010	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)	EPA 1668C_2010	1
3,3',4,4',5-Pentachlorobiphenyl (BZ-126)	EPA 1668C_2010	1
3,3',4,4'-Tetrachlorobiphenyl (BZ-77)	EPA 1668C_2010	1
3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)	EPA 1668C_2010	1
3,3',4,5-Tetrachlorobiphenyl (BZ-78)	EPA 1668C_2010	1
3,3',4,5'-Tetrachlorobiphenyl (BZ-79)	EPA 1668C_2010	1
3,3',4-Trichlorobiphenyl (BZ-35)	EPA 1668C_2010	1
3,3',5,5'-Tetrachlorobiphenyl (BZ-80)	EPA 1668C_2010	1
3,3',5-Trichlorobiphenyl (BZ-36)	EPA 1668C_2010	1
3,3'-Dichlorobiphenyl (BZ-11)	EPA 1668C_2010	1
3,4,4',5-Tetrachlorobiphenyl (BZ-81)	EPA 1668C_2010	1
3,4,4'-Trichlorobiphenyl (BZ-37)	EPA 1668C_2010	1
3,4,5-Trichlorobiphenyl (BZ-38)	EPA 1668C_2010	1

Matrix/Analyte	**Method**	**Notes**
Solid and Chemical Materials		
3,4',5-Trichlorobiphenyl (BZ-39)	EPA 1668C_2010	1
3,4-Dichlorobiphenyl (BZ-12)	EPA 1668C_2010	1
3,4'-Dichlorobiphenyl (BZ-13)	EPA 1668C_2010	1
3,5-Dichlorobiphenyl (BZ-14)	EPA 1668C_2010	1
3-Chlorobiphenyl (BZ-2)	EPA 1668C_2010	1
4,4'-Dichlorobiphenyl (BZ-15)	EPA 1668C_2010	1
4-Chlorobiphenyl (BZ-3)	EPA 1668C_2010	1
Coelution - Dichlorobiphenyls (BZ-12-+13)	EPA 1668C_2010	1,9
Coelution - Heptachlorobiphenyls (BZ-171 + BZ-173)	EPA 1668C_2010	1,9
Coelution - Heptachlorobiphenyls (BZ-180 + BZ-193)	EPA 1668C_2010	1,9
Coelution - Heptachlorobiphenyls (BZ-183 + BZ-185)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-128 + BZ-166)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-129 + BZ138 + BZ-163)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-135 + BZ-151)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-139 + BZ-140)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-147 + BZ-149)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-153 + BZ-168)	EPA 1668C_2010	1,9
Coelution - Hexachlorobiphenyls (BZ-156 + BZ-157)	EPA 1668C_2010	1,9
Coelution - Octachlorobiphenyls (BZ-197 + BZ-200)	EPA 1668C_2010	1,9
Coelution - Octachlorobiphenyls (BZ-198 + BZ-199)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-108 + BZ-124)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-110 + BZ-115)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-97 + BZ-109 + BZ-119 + BZ-125)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-93 + BZ-100)	EPA 1668C_2010	1,9
Coelution - Pentachlorobiphenyls (BZ-98 + BZ-102)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-40 + BZ-71)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-49 + BZ-69)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-50 + BZ-53)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)	EPA 1668C_2010	1,9
Coelution - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-18 + BZ-30)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-20 + BZ-28)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-21 + BZ-33)	EPA 1668C_2010	1,9
Coelution - Trichlorobiphenyls (BZ-26 + BZ-29)	EPA 1668C_2010	1,9

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Decachlorobiphenyl (BZ-209)	EPA 1668C_2010	1
PCBs, as congeners	EPA 1668C_2010	1,9
Total Dichlorobiphenyls	EPA 1668C_2010	1,9
Total Heptachlorobiphenyls	EPA 1668C_2010	1,9
Total Hexachlorobiphenyls	EPA 1668C_2010	1,9
Total Monochlorobiphenyls	EPA 1668C_2010	1,9
Total Nonachlorobiphenyls	EPA 1668C_2010	1,9
Total Octachlorobiphenyls	EPA 1668C_2010	1,9
Total Pentachlorobiphenyls	EPA 1668C_2010	1,9
Total Tetrachlorobiphenyls	EPA 1668C_2010	1,9
Total Trichlorobiphenyls	EPA 1668C_2010	1,9
1,1,1,2-Tetrachloroethane	EPA 8260D_4_(6/18)	1
1,1,1-Trichloroethane	EPA 8260D_4_(6/18)	1
1,1,2,2-Tetrachloroethane	EPA 8260D_4_(6/18)	1
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA 8260D_4_(6/18)	1
1,1,2-Trichloroethane	EPA 8260D_4_(6/18)	1
1,1-Dichloroethane	EPA 8260D_4_(6/18)	1
1,1-Dichloroethylene	EPA 8260D_4_(6/18)	1
1,1-Dichloropropene	EPA 8260D_4_(6/18)	1
1,2,3-Trichlorobenzene	EPA 8260D_4_(6/18)	1
1,2,3-Trichloropropane	EPA 8260D_4_(6/18)	1
1,2,3-Trimethylbenzene	EPA 8260D_4_(6/18)	1
1,2,4-Trichlorobenzene	EPA 8260D_4_(6/18)	1
1,2,4-Trimethylbenzene	EPA 8260D_4_(6/18)	1
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260D_4_(6/18)	1
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260D_4_(6/18)	1
1,2-Dichlorobenzene	EPA 8260D_4_(6/18)	1
1,2-Dichloroethane (Ethylene dichloride)	EPA 8260D_4_(6/18)	1
1,2-Dichloropropane	EPA 8260D_4_(6/18)	1
1,3,5-Trimethylbenzene	EPA 8260D_4_(6/18)	1
1,3-Dichlorobenzene	EPA 8260D_4_(6/18)	1
1,3-Dichloropropane	EPA 8260D_4_(6/18)	1
1,4-Dichlorobenzene	EPA 8260D_4_(6/18)	1
2,2-Dichloropropane	EPA 8260D_4_(6/18)	1
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260D_4_(6/18)	1
2-Chloroethyl vinyl ether	EPA 8260D_4_(6/18)	1
2-Chlorotoluene	EPA 8260D_4_(6/18)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
2-Hexanone	EPA 8260D_4_(6/18)	1
2-Nitropropane	EPA 8260D_4_(6/18)	1
4-Chlorotoluene	EPA 8260D_4_(6/18)	1
4-Isopropyltoluene (p-Cymene)	EPA 8260D_4_(6/18)	1
4-Methyl-2-pentanone (MIBK)	EPA 8260D_4_(6/18)	1
Acetone	EPA 8260D_4_(6/18)	1
Acetonitrile	EPA 8260D_4_(6/18)	1
Acrolein (Propenal)	EPA 8260D_4_(6/18)	1
Acrylonitrile	EPA 8260D_4_(6/18)	1
Allyl chloride (3-Chloropropene)	EPA 8260D_4_(6/18)	1
Benzene	EPA 8260D_4_(6/18)	1
Benzyl chloride	EPA 8260D_4_(6/18)	1
Bromobenzene	EPA 8260D_4_(6/18)	1
Bromochloromethane	EPA 8260D_4_(6/18)	1
Bromodichloromethane	EPA 8260D_4_(6/18)	1
Bromoform	EPA 8260D_4_(6/18)	1
Butyl acetate	EPA 8260D_4_(6/18)	1
Carbon disulfide	EPA 8260D_4_(6/18)	1
Carbon tetrachloride	EPA 8260D_4_(6/18)	1
Chlorobenzene	EPA 8260D_4_(6/18)	1
Chlorodibromomethane	EPA 8260D_4_(6/18)	1
Chloroethane (Ethyl chloride)	EPA 8260D_4_(6/18)	1
Chloroform	EPA 8260D_4_(6/18)	1
Chloroprene (2-Chloro-1,3-butadiene)	EPA 8260D_4_(6/18)	1
cis-1,2-Dichloroethylene	EPA 8260D_4_(6/18)	1
cis-1,3-Dichloropropene	EPA 8260D_4_(6/18)	1
Cyclohexane	EPA 8260D_4_(6/18)	1
Cyclohexanone	EPA 8260D_4_(6/18)	1
Dibromomethane	EPA 8260D_4_(6/18)	1
Dichlorodifluoromethane (Freon-12)	EPA 8260D_4_(6/18)	1
Di-isopropylether (DIPE)	EPA 8260D_4_(6/18)	1
Ethanol	EPA 8260D_4_(6/18)	1
Ethyl acetate	EPA 8260D_4_(6/18)	1
Ethyl methacrylate	EPA 8260D_4_(6/18)	1
Ethylbenzene	EPA 8260D_4_(6/18)	1
Ethyl-t-butylether (ETBE)	EPA 8260D_4_(6/18)	1
Hexachlorobutadiene	EPA 8260D_4_(6/18)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Iodomethane (Methyl iodide)	EPA 8260D_4_(6/18)	1
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260D_4_(6/18)	1
Isopropyl alcohol (2-Propanol, Isopropanol)	EPA 8260D_4_(6/18)	1
Isopropylbenzene	EPA 8260D_4_(6/18)	1
m+p-xylene	EPA 8260D_4_(6/18)	1
Methacrylonitrile	EPA 8260D_4_(6/18)	1
Methyl acetate	EPA 8260D_4_(6/18)	1
Methyl bromide (Bromomethane)	EPA 8260D_4_(6/18)	1
Methyl chloride (Chloromethane)	EPA 8260D_4_(6/18)	1
Methyl methacrylate	EPA 8260D_4_(6/18)	1
Methyl tert-butyl ether (MTBE)	EPA 8260D_4_(6/18)	1
Methylcyclohexane	EPA 8260D_4_(6/18)	1
Methylene chloride (Dichloromethane)	EPA 8260D_4_(6/18)	1
Naphthalene	EPA 8260D_4_(6/18)	1
n-Butyl alcohol (1-Butanol, n-Butanol)	EPA 8260D_4_(6/18)	1
n-Butylbenzene	EPA 8260D_4_(6/18)	1
n-Hexane	EPA 8260D_4_(6/18)	1
n-Propylbenzene	EPA 8260D_4_(6/18)	1
o-Xylene	EPA 8260D_4_(6/18)	1
Pentachloroethane	EPA 8260D_4_(6/18)	1
Propionitrile (Ethyl cyanide)	EPA 8260D_4_(6/18)	1
sec-Butylbenzene	EPA 8260D_4_(6/18)	1
Styrene	EPA 8260D_4_(6/18)	1
tert-amylmethylether (TAME)	EPA 8260D_4_(6/18)	1
tert-Butyl alcohol	EPA 8260D_4_(6/18)	1
tert-Butylbenzene	EPA 8260D_4_(6/18)	1
Tetrachloroethylene (Perchloroethylene)	EPA 8260D_4_(6/18)	1
Tetrahydrofuran (THF)	EPA 8260D_4_(6/18)	1
Toluene	EPA 8260D_4_(6/18)	1
trans-1,2-Dichloroethylene	EPA 8260D_4_(6/18)	1
trans-1,3-Dichloropropylene	EPA 8260D_4_(6/18)	1
trans-1,4-Dichloro-2-butene	EPA 8260D_4_(6/18)	1
Trichloroethene (Trichloroethylene)	EPA 8260D_4_(6/18)	1
Trichlorofluoromethane (Freon 11)	EPA 8260D_4_(6/18)	1
Vinyl acetate	EPA 8260D_4_(6/18)	1
Vinyl chloride	EPA 8260D_4_(6/18)	1
Xylene (total)	EPA 8260D_4_(6/18)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
1,2,4,5-Tetrachlorobenzene	EPA 8270E_6_(6/18)	1
1,2,4-Trichlorobenzene	EPA 8270E_6_(6/18)	1
1,2-Dichlorobenzene	EPA 8270E_6_(6/18)	1
1,2-Diphenylhydrazine	EPA 8270E_6_(6/18)	1
1,3-Dichlorobenzene	EPA 8270E_6_(6/18)	1
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270E_6_(6/18)	1
1,4-Dichlorobenzene	EPA 8270E_6_(6/18)	1
1,4-Dinitrobenzene	EPA 8270E_6_(6/18)	1
1,4-Naphthoquinone	EPA 8270E_6_(6/18)	1
1-Chloronaphthalene	EPA 8270E_6_(6/18)	1
1-Methylnaphthalene	EPA 8270E_6_(6/18)	1
1-Naphthylamine	EPA 8270E_6_(6/18)	1
2,2'-Oxybis(1-chloropropane)	EPA 8270E_6_(6/18)	1
2,3,4,6-Tetrachlorophenol	EPA 8270E_6_(6/18)	1
2,4,5-Trichlorophenol	EPA 8270E_6_(6/18)	1
2,4,6-Trichlorophenol	EPA 8270E_6_(6/18)	1
2,4-Dichlorophenol	EPA 8270E_6_(6/18)	1
2,4-Dimethylphenol	EPA 8270E_6_(6/18)	1
2,4-Dinitrophenol	EPA 8270E_6_(6/18)	1
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270E_6_(6/18)	1
2,6-Dichlorophenol	EPA 8270E_6_(6/18)	1
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270E_6_(6/18)	1
2-Acetylaminofluorene	EPA 8270E_6_(6/18)	1
2-Chloronaphthalene	EPA 8270E_6_(6/18)	1
2-Chlorophenol	EPA 8270E_6_(6/18)	1
2-Methylaniline (o-Toluidine)	EPA 8270E_6_(6/18)	1
2-Methylnaphthalene	EPA 8270E_6_(6/18)	1
2-Methylphenol (o-Cresol)	EPA 8270E_6_(6/18)	1
2-Naphthylamine	EPA 8270E_6_(6/18)	1
2-Nitroaniline	EPA 8270E_6_(6/18)	1
2-Nitrophenol	EPA 8270E_6_(6/18)	1
2-Picoline (2-Methylpyridine)	EPA 8270E_6_(6/18)	1
3,3'-Dichlorobenzidine	EPA 8270E_6_(6/18)	1
3,3'-Dimethylbenzidine	EPA 8270E_6_(6/18)	1
3-Methylcholanthrene	EPA 8270E_6_(6/18)	1
3-Nitroaniline	EPA 8270E_6_(6/18)	1
4,4'-Methylenebis(2-chloroaniline)	EPA 8270E_6_(6/18)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
4,6-Dinitro-2-methylphenol	EPA 8270E_6_(6/18)	1
4-Aminobiphenyl	EPA 8270E_6_(6/18)	1
4-Bromophenyl phenyl ether (BDE-3)	EPA 8270E_6_(6/18)	1
4-Chloro-3-methylphenol	EPA 8270E_6_(6/18)	1
4-Chloroaniline	EPA 8270E_6_(6/18)	1
4-Chlorophenyl phenylether	EPA 8270E_6_(6/18)	1
4-Dimethyl aminoazobenzene	EPA 8270E_6_(6/18)	1
4-Nitroaniline	EPA 8270E_6_(6/18)	1
4-Nitrophenol	EPA 8270E_6_(6/18)	1
4-Nitroquinoline 1-oxide	EPA 8270E_6_(6/18)	1
5-Nitro-o-toluidine	EPA 8270E_6_(6/18)	1
7,12-Dimethylbenz(a) anthracene	EPA 8270E_6_(6/18)	1
Acenaphthene	EPA 8270E_6_(6/18)	1
Acenaphthylene	EPA 8270E_6_(6/18)	1
Acetophenone	EPA 8270E_6_(6/18)	1
Aniline	EPA 8270E_6_(6/18)	1
Anthracene	EPA 8270E_6_(6/18)	1
Atrazine	EPA 8270E_6_(6/18)	1
Benzaldehyde	EPA 8270E_6_(6/18)	1
Benzidine	EPA 8270E_6_(6/18)	1
Benzo(a)anthracene	EPA 8270E_6_(6/18)	1
Benzo(a)pyrene	EPA 8270E_6_(6/18)	1
Benzo(g,h,i)perylene	EPA 8270E_6_(6/18)	1
Benzo(k)fluoranthene	EPA 8270E_6_(6/18)	1
Benzo[b]fluoranthene	EPA 8270E_6_(6/18)	1
Benzoic acid	EPA 8270E_6_(6/18)	1
Benzyl alcohol	EPA 8270E_6_(6/18)	1
Biphenyl	EPA 8270E_6_(6/18)	1
bis(2-Chloroethoxy)methane	EPA 8270E_6_(6/18)	1
bis(2-Chloroethyl) ether	EPA 8270E_6_(6/18)	1
Butyl benzyl phthalate	EPA 8270E_6_(6/18)	1
Caprolactam	EPA 8270E_6_(6/18)	1
Carbazole	EPA 8270E_6_(6/18)	1
Chlorobenzilate	EPA 8270E_6_(6/18)	1
Chrysene	EPA 8270E_6_(6/18)	1
Di(2-ethylhexyl)phthalate	EPA 8270E_6_(6/18)	1
Diallate	EPA 8270E_6_(6/18)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
Dibenz(a,h) acridine	EPA 8270E_6_(6/18)	1
Dibenz(a,h) anthracene	EPA 8270E_6_(6/18)	1
Dibenz(a,j) acridine	EPA 8270E_6_(6/18)	1
Dibenzofuran	EPA 8270E_6_(6/18)	1
Diethyl phthalate	EPA 8270E_6_(6/18)	1
Dimethoate	EPA 8270E_6_(6/18)	1
Dimethyl phthalate	EPA 8270E_6_(6/18)	1
Di-n-butyl phthalate	EPA 8270E_6_(6/18)	1
Di-n-octyl phthalate	EPA 8270E_6_(6/18)	1
Diphenylamine	EPA 8270E_6_(6/18)	1
Ethyl methanesulfonate	EPA 8270E_6_(6/18)	1
Fluoranthene	EPA 8270E_6_(6/18)	1
Fluorene	EPA 8270E_6_(6/18)	1
Hexachlorobenzene	EPA 8270E_6_(6/18)	1
Hexachlorobutadiene	EPA 8270E_6_(6/18)	1
Hexachlorocyclopentadiene	EPA 8270E_6_(6/18)	1
Hexachloroethane	EPA 8270E_6_(6/18)	1
Hexachloropropene	EPA 8270E_6_(6/18)	1
Indene	EPA 8270E_6_(6/18)	1
Indeno(1,2,3-cd) pyrene	EPA 8270E_6_(6/18)	1
Isodrin	EPA 8270E_6_(6/18)	1
Isophorone	EPA 8270E_6_(6/18)	1
Isosafrole	EPA 8270E_6_(6/18)	1
m+p Cresol	EPA 8270E_6_(6/18)	1
Methyl methanesulfonate	EPA 8270E_6_(6/18)	1
Methyl parathion (Parathion, methyl)	EPA 8270E_6_(6/18)	1
Naphthalene	EPA 8270E_6_(6/18)	1
Nitrobenzene	EPA 8270E_6_(6/18)	1
n-Nitrosodiethylamine	EPA 8270E_6_(6/18)	1
n-Nitrosodimethylamine	EPA 8270E_6_(6/18)	1
n-Nitroso-di-n-butylamine	EPA 8270E_6_(6/18)	1
N-Nitroso-di-n-propylamine	EPA 8270E_6_(6/18)	1
n-Nitrosodiphenylamine	EPA 8270E_6_(6/18)	1
N-Nitrosomethylethylamine	EPA 8270E_6_(6/18)	1
n-Nitrosomorpholine	EPA 8270E_6_(6/18)	1
n-Nitrosopiperidine	EPA 8270E_6_(6/18)	1
n-Nitrosopyrrolidine	EPA 8270E_6_(6/18)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
o,o,o-Triethyl phosphorothioate	EPA 8270E_6_(6/18)	1
Parathion	EPA 8270E_6_(6/18)	1
Pentachlorobenzene	EPA 8270E_6_(6/18)	1
Pentachloronitrobenzene	EPA 8270E_6_(6/18)	1
Pentachlorophenol	EPA 8270E_6_(6/18)	1
Phenacetin	EPA 8270E_6_(6/18)	1
Phenanthrene	EPA 8270E_6_(6/18)	1
Phenol	EPA 8270E_6_(6/18)	1
Phorate	EPA 8270E_6_(6/18)	1
Pronamide (Kerb)	EPA 8270E_6_(6/18)	1
Pyrene	EPA 8270E_6_(6/18)	1
Pyridine	EPA 8270E_6_(6/18)	1
Quinoline	EPA 8270E_6_(6/18)	1
Safrole	EPA 8270E_6_(6/18)	1
Tetraethyl dithiopyrophosphate	EPA 8270E_6_(6/18)	1
Thionazin (Zinophos)	EPA 8270E_6_(6/18)	1
1-Methylnaphthalene	EPA 8270E_6_(6/18) SIM	1
2-Methylnaphthalene	EPA 8270E_6_(6/18) SIM	1
Acenaphthene	EPA 8270E_6_(6/18) SIM	1
Acenaphthylene	EPA 8270E_6_(6/18) SIM	1
Anthracene	EPA 8270E_6_(6/18) SIM	1
Benzo(a)anthracene	EPA 8270E_6_(6/18) SIM	1
Benzo(a)pyrene	EPA 8270E_6_(6/18) SIM	1
Benzo(g,h,i)perylene	EPA 8270E_6_(6/18) SIM	1
Benzo(k)fluoranthene	EPA 8270E_6_(6/18) SIM	1
Benzo[b]fluoranthene	EPA 8270E_6_(6/18) SIM	1
Chrysene	EPA 8270E_6_(6/18) SIM	1
Dibenz(a,h) anthracene	EPA 8270E_6_(6/18) SIM	1
Fluoranthene	EPA 8270E_6_(6/18) SIM	1
Fluorene	EPA 8270E_6_(6/18) SIM	1
Indeno(1,2,3-cd) pyrene	EPA 8270E_6_(6/18) SIM	1
Naphthalene	EPA 8270E_6_(6/18) SIM	1
Phenanthrene	EPA 8270E_6_(6/18) SIM	1
Pyrene	EPA 8270E_6_(6/18) SIM	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8290A_1_(2/07)	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290A_1_(2/07)	1
1,2,3,4,6,7,8-Hpcdd	EPA 8290A_1_(2/07)	1

Matrix/Analyte	Method	Notes
Solid and Chemical Materials		
1,2,3,4,6,7,8-Hpcdf	EPA 8290A_1_(2/07)	1
1,2,3,4,7,8,9-Hpcdf	EPA 8290A_1_(2/07)	1
1,2,3,4,7,8-Hxcdd	EPA 8290A_1_(2/07)	1
1,2,3,4,7,8-Hxcdf	EPA 8290A_1_(2/07)	1
1,2,3,6,7,8-Hxcdd	EPA 8290A_1_(2/07)	1
1,2,3,6,7,8-Hxcdf	EPA 8290A_1_(2/07)	1
1,2,3,7,8,9-Hxcdd	EPA 8290A_1_(2/07)	1
1,2,3,7,8,9-Hxcdf	EPA 8290A_1_(2/07)	1
1,2,3,7,8-Pecdd	EPA 8290A_1_(2/07)	1
1,2,3,7,8-Pecdf	EPA 8290A_1_(2/07)	1
2,3,4,6,7,8-Hxcdf	EPA 8290A_1_(2/07)	1
2,3,4,7,8-Pecdf	EPA 8290A_1_(2/07)	1
2,3,7,8-TCDD	EPA 8290A_1_(2/07)	1
2,3,7,8-TCDF	EPA 8290A_1_(2/07)	1
Hpcdd, total	EPA 8290A_1_(2/07)	1
Hpcdf, total	EPA 8290A_1_(2/07)	1
Hxcdd, total	EPA 8290A_1_(2/07)	1
Hxcdf, total	EPA 8290A_1_(2/07)	1
Pecdd, total	EPA 8290A_1_(2/07)	1
Pecdf, total	EPA 8290A_1_(2/07)	1
TCDD, total	EPA 8290A_1_(2/07)	1
TCDF, total	EPA 8290A_1_(2/07)	1
Ignitability	EPA 1010A - 2002	1

Accredited Parameter Note Detail

(1) Accreditation based in part on recognition of Pennsylvania NELAP accreditation. (2) Accreditation based in part on recognition of Louisiana NELAP accreditation. (3) Method modified to determine this analyte. (4) Provisional accreditation pending submittal of additional, acceptable Proficiency Testing (PT) results (WAC 173-50-110). (5) Accreditation is limited to liquid matrix only (6) Extraction Method EPA 3511.(7) Holding time of 15 minutes must be observed for compliance monitoring. (8) SOP T-PFAS-WI14355 is based upon EPA Method 537.1 using LC/MS/MS, also has isotope dilution.(9) Co-elutions and groups the Lab analyzes and reports. Third party recognition is by recognizing the individual congeners listed in the Lab primary accreditation authorities' scope.(10) Membrane (11) LDO

05/03/2022

Authentication Signature
Rebecca Wood, Lab Accreditation Unit Supervisor

Date

Appendix B

Laboratory Standard Operating Procedures (available upon request, not for public distribution)

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Appendix C

Field Operating Procedures

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APPENDIX C REFERENCE TABLE

NAVFAC Northwest SOPs

SOP-A-7 IDW Management

SOP I-A-9 General Field Operations

SOP I-A-10 Monitoring/Sampling Location Recording

SOP I-A-11 Sample Naming

SOP I-B-8 Sediment Sampling

SOP I-C-3 Monitoring Well Sampling

SOP I-C-5 Low-Flow Groundwater Purging and Sampling

SOP I-D-5 Water Level Measurements

SOP I-D-7 Field Parameter Measurements

SOP III-A Laboratory QC Samples

SOP III-B Field QC Samples

SOP III-D Logbooks

SOP III-E Record Keeping, Sampling Labeling, COC Procedures

SOP-III-F Sample Containers and Preservation

SOP-III-G Sample Handling, Storage, and Shipping

SOP-III-I Equipment Decontamination

SOP-III-J Equipment Calibration, Operation, and Maintenance

EA Field Procedures and SOPs

Field Procedure 1 Mobilization and Demobilization

Field Procedure 2 Water Level/Light Non-Aqueous Phase Liquid Measurement

Field Procedure 3 Field Parameter Measurement for Groundwater Sampling

Field Procedure 4 Low-Flow Purge Procedure for Groundwater Sampling

Field Procedure 5 Decontamination of Field Instrumentation and Low-Flow Groundwater Sampling Equipment

Field Procedure 6 Sample Packing and Shipment

Field Procedure 7 Keeping a Site Logbook

Field Procedure 8 Water Quality Meter Calibration

Standard Operating Procedure No. 057 for Incremental Sampling Methodology

Standard Operating Procedure No. 073 for Sampling for Per- and Polyfluorinated Alkyl Substances

ACRONYMS AND ABBREVIATIONS FOR APPENDIX C

°C	Celsius
APP	Accident Prevention Plan
ASTM	ASTM International
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
EA	EA Engineering, Science, and Technology, Inc., PBC
in.	inch(es)
LN2	liquid nitrogen
LNAPL	light non-aqueous phase liquid
mg/L	milligram(s) per liter
mV	milliVolt
NTU	nephelometric turbidity unit
ORP	oxidation reduction potential
ppm	parts per million
PID	photoionization detector
PVC	polyvinyl chloride
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
TO	task order
TOM	Task Order Manager
VOA	volatile organic analysis
VOC	volatile organic compound

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FIELD PROCEDURE 1
MOBILIZATION AND DEMOBILIZATION

This field investigation activity consists of field personnel orientation, equipment mobilization, determination of sampling locations, and demobilization. Field team members will attend an onsite orientation meeting to become familiar with the history of the site, health and safety requirements, and field investigation procedures.

Equipment mobilization will include the ordering, renting, and/or purchasing of sampling supplies and equipment needed for the field investigation. An inventory of available supplies and equipment will be conducted prior to field activities being initiated, and additional equipment required will be secured as needed.

Equipment and personnel will be demobilized at the completion of each phase of field activities as necessary. Equipment for demobilization may include (but will not be limited to) sampling equipment. Demobilization activities will also consist of site area cleanup, management of investigation-derived wastes, and organization of investigation records.

FIELD PROCEDURE 2
WATER LEVEL/LIGHT NON-AQUEOUS PHASE LIQUID MEASUREMENT

Static water level measurements will be taken in installed monitoring wells and piezometers (as applicable) prior to each groundwater sampling event.

Water level and light non-aqueous phase liquid (LNAPL) measurements will be conducted in accordance with the following procedures:

- Remove the well cap and conduct air monitoring as prescribed in the Accident Protection Plan (APP) to verify that the concentration of contaminants VOCs as screened with a PID present in the breathing zone are below the levels allowable to conduct work.
- Collect LNAPL and groundwater level measurements from monitoring wells with an electronic water level indicator equipped with water level markings at increments of 0.01 foot or less. Use an interface probe to check for the presence of LNAPL. Measure relative to surveyed data (i.e., top of the well riser) at a specific mark on the casing to the nearest 0.01 foot.
- Slowly lower the oil/water interface probe until either LNAPL (typically a continuous alarm) or water (typically an intermittent alarm) is encountered. Record the measurement in the logbook and/or on the appropriate field form.
- If LNAPL is encountered, continue to slowly lower the interface probe until water (intermittent alarm) is encountered. Slowly retract the interface probe until LNAPL (continuous alarm) is encountered. Record the depth in the field logbook and/or on the appropriate field form. Continue retracting the interface probe until the probe is through the LNAPL layer (no alarm).
- Repeat to confirm measurements. If there is a discrepancy in depths, decontaminate the probe sensor and recheck depth measurements.
- Decontaminate the water level indicator cable, tape, and probe as described in Field Procedure 5.

FIELD PROCEDURE 3
FIELD PARAMETER MEASUREMENT FOR GROUNDWATER SAMPLING

Field parameters (temperature, pH, turbidity, oxidation reduction potential [ORP], specific conductance, salinity, and dissolved oxygen [DO]) will be monitored during the purging of the monitoring wells with a Horiba™ water quality meter or equivalent. Measurements will be conducted in accordance with the manufacturer's instructions and the following procedures:

- Calibrate or verify calibration of the water quality meter according to Field Procedure 8.
- For low-flow purging of the monitoring wells:
  - After determining the static water level following Field Procedure 2, set up and begin purging well.
  - Determine the flow rate using a graduated cylinder or equivalent.
  - Attach a flow-through cell to the polyethylene tubing. Position the water quality meter probe in the flow-through cell. Begin purging the monitoring well.
  - After the cell has been flushed at least twice, begin monitoring the field parameters, and continue approximately every 3 to 5 minutes during purging.
  - Record water quality measurements in a field logbook or on the appropriate well-purge data sheet.
  - When the indicator parameters have stabilized for three consecutive readings (as defined in Field Procedure 3), the well is considered stabilized and ready for sample collection (per Field Procedures 4 Low-Flow groundwater sampling and 9 Soil Sampling, as applicable). Remove the flow-through cell from the tubing.
- Decontaminate the water quality meter probe between sampling locations, as described in Field Procedure 5.

FIELD PROCEDURE 4
LOW-FLOW PURGE PROCEDURE FOR GROUNDWATER SAMPLING

Monitoring well samples will be analyzed as presented in the Sampling and Analysis Plan (SAP). The following steps describe the procedure for sampling groundwater from a monitoring well:

1. Check and record the condition of the well for damage or evidence of tampering.
2. Remove the well cap.
3. Conduct air monitoring per the APP. This may include measuring well headspace with a photoionization detector (PID). Record readings in the field logbook.
4. Conduct a water level/LNAPL measurement per Field Procedure 2.
5. Set up the monitoring, purging, and sampling equipment. To avoid cross contamination, do not allow down-hole equipment to touch the ground.
6. For wells with dedicated polyethylene tubing, attach the tubing to the peristaltic pump rotor and rollers, and lower the remaining polyethylene tubing into the well casing. A new section of polyethylene tubing is attached to the outflow of the pump head for sampling. For submersible pumps, attach and secure the polyethylene tubing to the low-flow submersible pump. Slowly lower the pump into the well to avoid disturbing the water column. Set the pump or tubing intake at approximately the middle of the screen or at the best depth based on the stratigraphy of the well.
7. For submersible pumps, do not place the pump intake less than 2 feet above the bottom of the well, as doing so may mobilize sediment present at the bottom of the well.
8. Start purging the well at 0.1 to 0.5 liter per minute.
9. Monitor the water level in the well periodically during pumping. Ideally, the pump rate should equal the well recharge rate with water level drawdown in the well of 0.3 foot or less. For submersible pumps, allow at least 1 foot of water over the pump intake so that there is no risk of the pump suction being broken or air being entrapped in the sample. If necessary, reduce the pumping rate to the minimum capability of the pump (0.1 to 0.2 liter per minute) to avoid purging the well dry. No more than 2 hours should elapse between purging and sampling to prevent groundwater interaction with the well casing.
10. During purging, monitor the field parameters (temperature, pH, turbidity, ORP, specific conductance, salinity, and DO) approximately every 3 to 5 minutes. A flow-through cell will be used to monitor the field parameters. Begin measuring field parameters after the flow-through cell has been flushed with groundwater twice.
11. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings, as follows:
    - Within 10 percent for temperature, specific conductance, and salinity

  - Within 0.2 units for pH
  - Within 10 percent, or within 0.1 milligrams per liter (mg/L) for DO
  - Within 10 percent, or less than 10 nephelometric turbidity units (NTUs), for turbidity
  - Within 10 milliVolts (mV) for oxidation reduction potential

   DO and turbidity usually require the longest time to achieve stabilization. Temperature and salinity have no stabilization criteria for this project. Do not remove the pump from the well between purging and sampling.

12. Once the field parameters have stabilized or three casing volumes of water have been removed, disconnect the flow-through cell from the outlet tubing, and collect the samples directly from the end of the tubing that exits the pump.
13. Fill sample bottles by allowing the pump discharge to flow down the inside of the bottle with minimal turbulence. Preserve and fill the bottles according to the procedures specified in the Sampling and Analysis Plan. Cap each bottle as it is filled.

    Volatile organic compounds (VOCs) are collected by filling each 40-milliters preserved volatile organic analysis (VOA) vial nearly to the top, then use the cap of the container to pour a meniscus to the top off the VOA vial, and then screw the cap onto the vial. VOA vials must be filled completely (i.e., no headspace or air bubbles). Each vial should be inverted, tapped, and visually inspected. If significant air bubbles are observed, the process must be repeated.

    Note: If effervescence is observed in the VOA vials, which can occur when samples contain high levels of carbonate salts, the aliquots should be collected without chemical preservatives.

14. Label the samples and record them on the chain-of-custody record per the Sampling and Analysis Plan. Immediately place them into a cooler for shipment and maintain samples requiring thermal preservation at ≤ 6 degrees Celsius (°C) (Field Procedure 6).
15. Carefully remove the submersible pump assembly from the well (as applicable). The dedicated tubing for both the submersible and peristaltic pumps will be left within each well casing.
16. Close and lock the well.

FIELD PROCEDURE 5
DECONTAMINATION OF FIELD INSTRUMENTATION AND LOW-FLOW GROUNDWATER SAMPLING EQUIPMENT

FIELD INSTRUMENTATION

Non-disposable field instrumentation used down wells (e.g., interface probes and water level measurement tape), water quality meter probes, and flow-through cells will be decontaminated thoroughly before use and after each location is sampled. For example, the water level measurement tape will be decontaminated by passing through a paper towel containing the following series of rinses: a Liquinox™ detergent solution, followed by a potable water rinse, followed by a deionized or distilled water rinse.

LOW-FLOW GROUNDWATER SAMPLING EQUIPMENT

Non-disposable sampling equipment (including the submersible pump, tubing, support cable, and electrical wires in contact with the sample) will be decontaminated thoroughly before use and after each well is sampled.

Before Initial Use and Between Well Decontamination for Submersible Pumps

1. Wash: Operate the submersible pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Liquinox™, for 5 minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.
2. Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

Decontamination of sampling equipment will be kept to a minimum in the field. Wherever possible, dedicated disposable sampling equipment will be used. Decontamination fluids generated will be collected in a container until the end of the work shift and properly disposed on site in the sanitary sewer per the waste information sheet (WIS). Personnel directly involved in equipment decontamination will wear appropriate protective clothing, as stated in the APP.

FIELD PROCEDURE 6
SAMPLE PACKING AND SHIPMENT

The following items for sample packing and shipping are required and will be assembled:

- Sampling and Analysis Plan
- Indelible blue or black ink pens
- Field logbook
- Ziploc bags (or equivalent)
- Coolers
- Blue Ice (or equivalent)
- Strapping tape, duct tape, or clear packing tape
- Garbage bags
- Sample logs
- Sample labels
- Chain-of-custody records
- Custody seals

Before they are packed, samples will be individually labeled and recorded in the field logbook. Labels will be completed with the required information. The samples will be assigned unique names, which will be documented on the chain-of-custody records. The following are typical packing and shipping procedures.

SAMPLES TO BE HAND-DELIVERED TO THE LABORATORY

- Attach a completed sampling label on each sample container.
- Wrap glass sample containers in bubble wrap.
- Place each sample container, or set of containers, in a plastic Ziploc™ bag (or equivalent) and align the label so it can be easily read, to the extent feasible, through the bubble wrap. Seal the bag.
- If thermal preservation is required, place individual samples into a cooler with seven or more Blue Ice™ packs (or equivalent) to maintain a low temperature ($\leq 6°C$).
    - Complete a chain-of-custody record and seal in a plastic Ziploc™ bag (or equivalent). Place the chain-of-custody record in the cooler. Always transport the cooler with its accompanying chain-of-custody record.
- Close and latch the cooler.

SAMPLES TO BE SHIPPED TO THE LABORATORY

- Attach a completed sampling label on each sample container.

- If shipping by commercial express delivery service (FedEx, United Parcel Service, etc.), place custody seals on each sample container (or group of volatile vials comprising a sample). If shipping by courier such as MC Delivery, it is not necessary to place custody seals on individual containers.
- Wrap glass sample containers in bubble wrap.
- Place each sample container or set of containers in a plastic Ziploc™ bag (or equivalent) and align the label so it can be easily read, to the extent feasible, through the bubble wrap. Seal the bag.
- Place individual samples into the cooler lined with a larger, heavy-duty plastic bag. Pack the sample containers. Surround the containers with frozen Blue Ice™ packs (or equivalent) if thermal preservation is required, so that they do not shift during transport and maintain a temperature of ≤ 6°C.
- Cover the head space inside the cooler with frozen Blue Ice™ packs (or equivalent) or cardboard.
- Complete a chain-of-custody form and seal in a plastic Ziploc™ bag (or equivalent) and place in the cooler.
- Close and latch the cooler. Wrap the cooler and lid with at least two turns of strapping or duct tape. Affix signed custody seals over the edge of the lid and the top of the cooler body at the front and back. Secure the custody seals to the cooler with at least one turn of clear packing tape.
- Label coolers with “up” arrows and the information necessary to comply with United States Department of Transportation requirements.

The Field Team Leader or designee will notify the laboratory of approximately when and how many samples will arrive. Samples requiring thermal preservation must be kept under refrigeration (or packed with Blue Ice™ or equivalent) between sampling and analysis processing. The sample containers will be checked for breakage on arrival at the laboratory.

FIELD PROCEDURE 7
KEEPING A SITE LOGBOOK

The site logbook is a bound notebook with consecutively numbered pages that cannot be removed. Major onsite activities that occur during the field event are recorded in the site logbook. At a minimum, the following activities and events are recorded:

- Arrival and departure of site visitors
- Sample and waste information
- Activities summary
- Individual activity start time or completion time
- Health and safety issues (e.g., level of protection, occurrence of incidents)

The site logbook is initiated at the start of the first onsite activity. Entries are made each day that onsite activities take place.

The site logbook becomes part of the permanent Task Order (TO) file located in the Contractor's Seattle office. It is critical that this document be properly maintained.

The site logbook is issued by the Task Order Manager (TOM), or designee, to the Site Superintendent, or designee, for the duration of field activities. It is the responsibility of the Field Task Leader to keep the site logbook current. Following the completion of fieldwork, the site logbook is returned to the contractor's office for inclusion in the permanent TO files.

The cover or inside cover page of each site logbook contains the following information:

- Logbook number
- Contract number
- TO number
- Project name
- Navy installation
- Site name(s)
- Start date
- End date
- Logbook assignment (personnel logbook is assigned to)
- Contractor name, address, and phone number
- Name of logbook reviewer and date of review.

Daily logbook entries may contain a variety of information. At the beginning of each day, the following information is recorded:

- Date
- Start time
- Weather conditions (if not included on field forms)

- Field personnel present
- Visitors present.

During the day, a summary of site activities and level of personal protective equipment is recorded in the logbook. It is not necessary to duplicate information recorded in other field notebooks or forms.

Measurements and equipment used to take measurements are recorded in the site logbook (or in a separate logbook). Equipment maintenance and calibration records will be traceable through field records to the person using the instrument and to the specific piece of instrumentation itself.

Entries are made with a waterproof black or blue pen. No erasures are permitted. If an incorrect entry is made, the data will be crossed out with a single strike mark, corrected, initialed, and dated. The logbook must be signed at the bottom of each page. When the day is completed, a line will be drawn through the remainder of the page.

PHOTOGRAPHS

Site photographs taken for project documentation will be recorded in the site logbook or a field notebook. When videos, slides, or photographs are taken of a site or any monitoring location, they are numbered to correspond to logbook entries. The date/time stamp function on the camera is verified and turned on so that photographs are stamped. The name of the photographer, date, time, site location, and site description are entered in the logbook. A series entry may be used to organize photographs. The photographer is not required to record the aperture settings and shutter speeds for photographs taken within the normal automatic exposure range. However, special lenses, films, filters, and other image-enhancement techniques are noted in the logbook. If possible, such techniques should be avoided because they can adversely affect the admissibility of photographs as evidence.

FIELD PROCEDURE 8
WATER QUALITY METER CALIBRATION

The YSI ProDSS, Horiba water quality meter, or equivalent will be calibrated at the beginning of each day prior to using the instrument to collect field parameters for samples (as detailed below). Alternatively, at the discretion of the operator, calibration may be omitted if a calibration check is performed and demonstrates the parameters are within the expected range.

YSI ProDSS

At the beginning of each sampling event, the YSI DSS Pro will be fully calibrated. The meter's calibration must be checked at the beginning of the day (immediately following calibration or in lieu of performing a calibration) and at the end of the day to determine if parameter values have drifted from original calibration. Additionally, it is highly recommended that a mid-day calibration check is performed so that any problems can be identified more readily. Calibration checks are not a recalibration of the meter but a check of the calibration to ensure the continued accuracy of the meter. Calibration values can be found on the calibration solution bottle. Use of the meter for field samples must be bracketed by calibration checks that are within the expected range. Instructions for calibration of each point are detailed below.

1. Barometer
    a. Determine barometric pressure (PB) in mmHg from a mercury barometer or weather service.
    b. Press "Cal" key and highlight "barometer" and press enter
    c. Select "Calibration Value," and enter the correct "true" barometric pressure.
    d. Select "Accept Calibration"
2. DO %
    a. Place a small amount of water (approximately 1/8 inch) in the calibration cup and slide it over the sensor guard. Tighten, but disengage a thread or two to ensure atmospheric venting.
    b. Make sure DO and temperature sensors are not immersed in the water and there aren't droplets on the sensors.
    c. Wait 5-10 minutes for the cup to become saturated.
    d. Press "Cal" key and select "ODO."
    e. Select "DO%."
    f. Verify the barometric pressure displayed is accurate. If not, recalibrate the barometer.

    g. Observe the actual measurement reading for stability, and if no significant change is observed for 40 seconds, select “Accept Calibration.”

3. pH
    a. Before calibration, rinse the calibration cup and sensor with a moderate amount of water, and discard.
    b. Rinse the calibration cup and sensors with a small amount of the buffer solution, and discard.
    c. Fill the calibration cup to the first line with the pH 7 standard.
    d. Immerse the sensors into the solution.
    e. Allow one minute for the temperature to stabilize.
    f. Select “Calibration value” then enter the calibration value of the standard used.
    g. Acceptable value for pH 7 mV in buffer is -50 mV to +50 mV
    h. Observe the actual measurement reading for stability, and if no significant change is observed for 40 seconds, select “Accept Calibration.”
    i. “Ready for cal point 2” will be displayed in the message area.
    j. Repeat steps a-f for pH 4 buffer solution
    k. Acceptable value for pH 4 mV in buffer is +165 mV to +180 mV from pH 7 buffer mV value
    l. “Ready for cal point 3” will be displayed in the message area.
    m. Repeat steps a-f for pH 10 buffer solution
    n. Acceptable value for pH 4 mV in buffer is +165 mV to +180 mV from pH 7 buffer mV value.
    o. The procedure will automatically finish after calibrating using a third buffer.
4. ORP
    a. Before calibration, rinse the calibration cup and sensor with a moderate amount of water, and discard.
    b. Rinse the calibration cup and sensors with a small amount of the buffer solution, and discard.
    c. Fill the calibration cup to the first line with the ORP standard.
    d. Immerse the sensors into the solution.
    e. Push the “Cal” key, select “pH/ORP,” then select “ORP.”
    f. Allow the temperature of the standard to stabilize.
    g. Select “Calibration value” then enter the calibration value of the standard used.
    h. Observe the actual measurement reading for stability, and if no significant change is observed for 40 seconds, select “Accept Calibration.”
5. Turbidity
    a. Before calibration, rinse the calibration cup and sensor with a moderate amount of water, and discard.

    b. Fill the calibration cup to the first line with the deionized water.
    c. Immerse the sensors into the deionized water.
    d. Push the “Cal” key and select “Turbidity.”
    e. Select “Calibration Value” and enter 0.00
    f. Acceptable value for Turbidity is 0 (+ 10 NTUs)
    g. Observe the actual measurement reading for stability, and if no significant change is observed for 40 seconds, select “Accept Calibration.”
    h. Select “Finish Calibration.”
6. Conductivity
    a. Rinse the calibration cup and sensors with a small amount of the buffer solution, and discard.
    b. Fill the calibration cup to the second line with the conductivity standard.
    c. Immerse the sensors into the solution and allow one minute for temperature equilibration before proceeding.
    d. Push the “Cal” key, select “Conductivity,” then select “Specific Conductance.”
    e. Select “Calibration value” then enter the calibration value of the standard used. Make sure the units displayed on the handheld match the units for the calibration solution. (For example, 10,000 µS = 10 mS).
    f. Observe the actual measurement reading for stability, and if no significant change is observed for 40 seconds, select “Accept Calibration.”

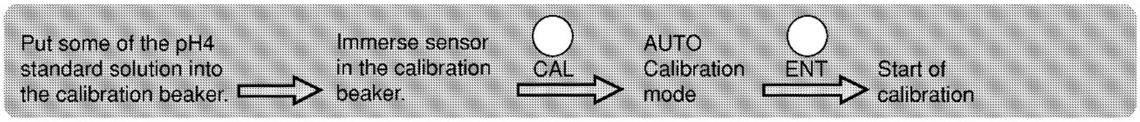
Horiba

The daily calibration will be performed using the Auto-Calibration function and a standard pH 4 Auto-Calibration solution. The Auto-Calibration function performs a one-point calibration of the pH sensor, conductivity sensor, and turbidity sensor in the standard pH 4 Auto-Calibration solution, while the dissolved oxygen sensor is calibrated in the atmosphere simultaneously. The following procedure is for Horiba U-20 series, however Horiba U-50 series follow similar procedures and have similar expected parameter values.

The meter’s calibration must be checked at the beginning of the day (immediately following calibration or in lieu of performing a calibration) and at the end of the day to determine if parameter values have drifted from original calibration. Additionally, it is highly recommended that a mid-day calibration check is performed so that any problems can be identified more readily. Calibration checks are not a recalibration of the meter but a check of the calibration to ensure the continued accuracy of the meter. Use of the meter for field samples must be bracketed by calibration checks that are within the expected range.

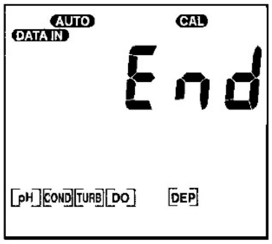
1. Triple-rinse the sensors with commercially available bottled drinking water.

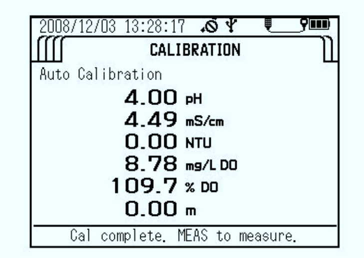
2. Fill the calibration beaker to the marked line with the standard pH 4 Auto-Calibration solution. If using a Horiba U-50 series, the transparent calibration beaker will need to be inserted into the black calibration beaker upon filling the transparent beaker with the pH 4 Auto-Calibration solution.
3. Immerse the sensors in the beaker.
4. Turn “On” water quality meter.
5. Press **CAL** button, then press **ENT** button to start Auto-Calibration.



6. Upon completion of the calibration of the pH, conductivity, turbidity, and dissolved oxygen sensors the water quality meter screen will display “END” for the U-20 series or “Cal Complete” for the U-50 series.

   *Note – If an error code is displayed, reference manufacturer’s Operation/Instruction Manual.





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CALIBRATION

Auto Calibration

4.00 pH
4.49 mS/cm
0.00 NTU
8.78 mg/L DO
109.7 % DO
0.00 m

Cal complete. MEAS to measure.

7. Press the **MEAS** button to display measured parameter values. Record, at a minimum, values for pH, turbidity, conductivity, and dissolved oxygen (values for temperature, salinity, and oxygen reduction potential may also be recorded to evaluate meter). Expected parameter value ranges are as follows:
   a. 4.00 units for pH (± 10%)
   b. 4.49 mS/cm for conductivity (± 10%)
   c. 0 NTUs for turbidity (+ 10 NTUs)
   d. 8.00 mg/L to 12.00 mg/L for DO (± 10%)

*Note – The age of the Auto-Calibration solution and temperature fluctuations can affect expected parameter value ranges. If the recorded parameter value is outside the expected range, consult the manufacturer’s Operations Manual for indicated value tables for parameters at various temperatures. If parameter values are outside of expected ranges, rinse sensors and perform Auto-Calibration again.

REFERENCES

Horiba, Ltd. 2000. Multi Water Quality Monitoring System U-020 Series Operation Manual.

Horiba, Ltd. 2009. Multi Water Quality Checker U-50 Series Instruction Manual.

NAVFAC Northwest. 2019. Standard Operating Procedure: NAVFAC Northwest Field Procedures Manual. Version 6.1. 2019.

YSI. 2020. ProDIGITAL User Manual

YSI. 2017. ProDSS Calibration Guide

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IDW MANAGEMENT

1.0 PURPOSE

This standard operating procedure (SOP) describes the activities and responsibilities of the U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) and their subcontractors with regard to management of investigation-derived waste (IDW). The purpose of this procedure provides guidance for the minimization, handling, labeling, temporary storage, and inventory of IDW generated during site investigations and remediation projects conducted under the direction of NAVFAC NW. **Each base may have specific required procedures**. These procedures are made available to the contractor through the NAVFAC Naval Technical Representative (NTR) or other government point of contact. This SOP is also applicable to personal protective equipment (PPE), sampling equipment, decontamination fluids, non-IDW trash, non-indigenous IDW, and hazardous waste and other regulated wastes generated during implementation of site investigations and removal or remedial actions. The information presented will be used to prepare and implement Work Plans (WP), Field Sampling Plans (FSP), and Waste Management Plans (WMPs) for IDW-related field activities.

2.0 PROCEDURES

The procedures for IDW management in the field are described below in Sections 2.1 to 2.5. The implementation of these procedures requires Remedial Project Managers (RPMs), Field Managers, their designates and subcontractors to perform the following tasks:

- Minimize generation of IDW,
- Segregate IDW,
- Properly handle IDW containers,
- Properly label IDW containers,
- Apply good management practices in storing IDW drums and containers,
- Prepare IDW drum inventories,
- Update and Report changes to IDW drum inventories,
- Perform inspections of IDW containers and storage areas, as required,
- Prepare IDW containers for proper off-site transportation and disposition, as required.

2.1 IDW MINIMIZATION

Field Managers and their designates shall minimize the generation of onsite IDW to reduce the need for special storage or disposal requirements that may result in substantial additional costs and provide little or no reduction in site risks (EPA 1992). The volume of IDW shall be reduced, by applying minimization practices throughout the course of site investigation activities. These minimization strategies include: 1) material substitution; 2) using proper low-volume drilling techniques; 3) using disposable sampling and PPE; 4) using bucket and drum liners; and 5) segregating non-contaminated IDW and trash from contaminated IDW. Waste minimization strategies and types of IDW expected to be generated shall be documented in the appropriate project plans.

2.1.1 Material Substitution

Material substitution consists of selecting materials that degrade readily or have reduced potential for chemical impacts to the site and the environment. An example of this practice is the use of biodegradable detergents (e.g., Alconox® or non-phosphate detergents) for decontamination of non-consumable PPE and sampling equipment. In addition, field equipment decontamination can be conducted using isopropyl alcohol rather than hexane or other solvents (for most analytes of concern), to reduce the potential onsite chemical impacts of the decontamination solvent. Decontamination solvents shall be selected carefully so that solvents, and their known decomposition products, do not result in generation of RCRA hazardous waste.

2.1.2 Drilling Methods

Drilling methods that minimize potential IDW generation should be given priority. Sonic, Hollow stem auger and air rotary methods should be selected, where feasible, over mud rotary methods. Mud rotary drilling produces waste drilling mud, while hollow stem and air rotary drilling methods produce relatively low volumes of soil waste. Sonic drilling produces the least amount of waste. Small diameter borings and cores shall be used when soil is the only matrix to be sampled at the boring location; the installation of monitoring wells requires the use of larger diameter borings.

Soil, sludge, or sediment removed from borings, containment areas, and shallow test trenches shall not be returned to the source, unless allowed by regulation and included in the approved WP, FSP, or WMP.

2.1.3 Decontamination Fluids

The use of disposable sampling equipment, such as plastic bailers, trowels, and drum thieves (which do not require decontamination) minimizes the quantity of decontamination fluids generated. In general, decontamination fluids, and well development and purge water, should not be minimized because the integrity of the associated analytical data may be affected.

2.1.4 PPE and Disposable Sampling Equipment

Visibly soiled PPE and disposable sampling equipment shall be segregated from non-visibly soiled PPE and sampling equipment. Where investigation involves potentially hazardous waste or other regulated wastes, visibly soiled PPE and disposable sampling equipment may require decontamination. The Field

Manager shall use best professional judgment to determine if decontamination is appropriate. This determination should be included in the approved WP, FSP, or WMP. If decontamination is performed, PPE and disposable sampling equipment generated in the decontamination process may be double-bagged and disposed of as non-hazardous waste.

2.1.5 Liners

Bucket liners can be used in the decontamination process to reduce the volume of solid IDW-generated and reduce costs on larger projects. The plastic bucket liners can be crushed into a smaller volume than the buckets, and only a small number of plastic decontamination buckets are required for the entire project. Larger, heavy-duty, 55-gallon drum liners can be used for heavily contaminated IDW to provide secondary containment, and reduce the costs of disposal and drum recycling. Drum liners may extend the containment life of the drums in severe climates and will reduce the costs of cleaning out the drums prior to recycling.

2.1.6 Segregation of non-IDW

All waste materials generated in the support zone are considered non-IDW trash. To minimize the total volume of IDW, all trash shall be separated from IDW, sealed in garbage bags, and properly disposed of offsite as municipal waste.

2.1.7 Monitoring Well Construction

Excess cement, sand, and bentonite grout prepared for monitoring well construction shall be kept to a minimum. Well construction shall be observed by Field Managers to ensure that a sufficient, but not excessive, volume of grout is prepared. Some excess grout may be produced. Unused grout that has not come in contact with potentially contaminated soil or ground water shall be considered non-hazardous trash and shall be disposed of offsite by the drilling subcontractor. Surplus materials from monitoring well installation, such as scrap PVC sections, used bentonite buckets, and cement/sand bags that do not come in contact with potentially contaminated soil, shall be considered non-IDW trash and shall be disposed of offsite by the drilling subcontractor.

2.1.8 Field Analytical Test Kits

IDW generated from the use of field analytical test kits consists of those parts of the kit that have been used and/or come into contact with potentially contaminated site media, or excess extracting solvents and other reagents. Potentially contaminated solid test kit IDW shall be contained in plastic bags and stored with PPE or disposable sampling equipment IDW from the same source area as soil material used for the analyses. The small volumes of waste solvents, reagents, and water samples used in field test kits should be segregated, and disposed of accordingly (based upon the characteristics of the materials, MSDS sheets, and as described in the WMP). Most other test kit materials should be considered non-IDW trash, and be disposed of as municipal waste.

2.2 SEGREGATION OF IDW BY MATRIX AND LOCATION

To facilitate subsequent IDW screening, sampling, classification and/or disposal, IDW shall generally be segregated by matrix and source location at the time it is generated. Each drum of solid IDW shall be completely filled, when possible. For liquid IDW, drums should be left with headspace of approximately 5% by volume to allow for expansion of the liquid and potential volatile contaminants. IDW from each distinct matrix shall be stored in a single drum (e.g., soil, water or PPE shall not be mixed in one drum). In general, IDW from separate sources should not be combined in a single drum.

It is possible that monitoring well development and purge water will contain suspended solids, which will settle to the bottom of the storage drum as sediment. Significant observations on the turbidity or sediment load of the development or purge water shall be included in the logbook and reported in attachments to the quarterly drum inventory report (see SOP III-D, *Logbooks* and Section 2.5). To avoid having mixed matrices in a single drum (i.e., sediment and water), it may be necessary to decant the liquids into a separate drum, after the sediments have settled out. This segregation may be accomplished during subsequent IDW sampling activities or during consolidation in a holding tank prior to disposal. Disposal of liquid IDW into the sanitary sewer shall only occur if approved by the appropriate regulatory agencies, municipal entities, and Naval installation. Appropriate precautions per the approved Health and Safety Plan (HASP) shall be implemented to ensure worker protection during these activities.

Potentially contaminated well construction material shall be placed in separate containers. Soil, sediment, sludge, or liquid IDW shall be segregated from potentially contaminated waste well construction materials. Potentially contaminated well construction materials from different monitoring wells shall not be commingled.

Potentially hazardous PPE and disposable sampling equipment shall be segregated from other IDW. PPE from generally clean field activities, such as water sampling, shall be segregated from visibly soiled PPE, double-bagged and disposed of offsite as municipal waste. Disposable sampling equipment from activities such as soil, sediment, and sludge sampling includes plastic sheeting used as liner material in containment areas around drilling rigs and waste storage areas; disposable sampling equipment; and soiled decontamination equipment. Where investigation involves potentially hazardous waste, visibly soiled PPE and disposable sampling equipment may require decontamination. The Field Manager shall use best professional judgment to determine if decontamination is appropriate. If decontamination is performed, PPE and disposable sampling equipment generated in the decontamination process may be double-bagged and disposed of as non-hazardous waste. PPE and disposable sampling equipment generated on separate days may be commingled.

Decontamination fluids shall be stored in drums separate from other IDW. If practical, decontamination fluids generated from different sources should not be stored in the same drum. If decontamination fluids generated over several days or from different sources are stored in a single container, information regarding dates of generation and sources shall be recorded in the field notebook, on the drum label (Section 2.3.2), and in the drum inventory (Section 2.5).

Liquid and sediment portions of the equipment decontamination fluid in the containment unit used by the drilling or excavation field crew should be separated. The contents of this unit normally consist of turbid decontamination fluid above a layer of predominantly coarse-grained sediment. When the contents of the containment unit are to be stored in IDW containers, the Field Manager shall direct the placement of as much liquid into drums as possible and transfer the remaining solids into separate drums. Observations of the turbidity and sediment load of the liquid IDW should be noted in the field notebook, on the drum label (Section 2.3.2), and in attachments to the drum inventory (see Section 2.5). It is likely that decontamination fluids will contain minor amounts of suspended solids that will settle out of suspension to become sediment at the bottom of IDW storage drums. As noted above, it may be necessary to segregate the drummed water from sediment during subsequent IDW sampling or disposal activities.

2.3 DRUM HANDLING AND LABELING

Drum handling consists of those actions necessary to prepare an IDW drum for labeling. Drum labeling consists of those actions required to legibly and permanently identify the contents of an IDW drum. Specific handling, storage, and labeling requirements may differ with the Naval installation or oversight entity. Specific requirements should be determined at the planning stage and documented in the WMP. General requirements are provided in the following sections.

2.3.1 Drum Handling

The drums used for containing IDW shall be approved by the United States Department of Transportation (DOT, 49 CFR 172). The drums shall be made of steel or plastic, have a 55-gallon capacity, be completely painted or opaque, and have removable lids (i.e., 1A1 or 1A2). New steel drums are preferred over recycled drums. For short-term storage of liquid IDW prior to discharge, double-walled bulk steel or plastic storage tanks may be used. Consideration must be given to scheduling and cost-effectiveness of bulk storage, treatment, and discharge system versus longer-term drum storage.

For long-term IDW storage, the DOT-approved drums with removable lids are recommended. The integrity of the foam or rubber sealing ring located on the underside of some drum lids shall be verified prior to sealing drums containing IDW liquids. If the ring is only partially attached to the drum lid, or if a portion of the ring is missing, a drum lid with sealing ring that is in good condition must be used. At some facilities, drums containing liquid IDW will be required to be stored in protective overpacks.

To prepare IDW drums for labeling, the outer wall surfaces and drum lids shall be wiped clean of all material that may prevent legible and permanent labeling. If potentially contaminated material adheres to the outer surface of a drum, that material shall be wiped from the drum, and the paper towel or rag used to remove the material shall be segregated with visibly soiled PPE and disposable sampling equipment.

2.3.2 Drum Labeling

Proper labeling of IDW drums is essential to the success and cost-effectiveness of subsequent waste screening and disposal activities. Labels shall be permanent and descriptive to facilitate correlation of field analytical data with the contents of individual IDW drums.

2.3.2.1 Preprinted Labels

A preprinted drum label as required by the appropriate Naval installation and/or regulatory agency shall be completed. The label will be affixed to the outside of the drum (or overpack if required) with the label easily readable for inspections and inventory. Label requirements may vary based on the site.

The requested information shall be printed legibly on the drum labels in black, indelible ink. Instructions for entering the required drum-specific information for each label field are provided by the Naval installation.

Painted Labels

An alternative method for labeling drums, if acceptable for the project, is to paint label information directly on the outer surface of the drum. At a minimum, the information placed on the drum shall include the contract/delivery order number, a drum number, the source identification type and number, the type of IDW, the generation date(s), and the government point of contact and telephone number. The drum surface shall be dry and free of material that could prevent legible labeling. Label information shall be confined to the upper two-thirds of the total drum height. The printing on the drum shall be large enough to be easily legible. Yellow, white, or red paint markers (oil-based enamel paint) that are non-photodegradable are recommended to provide maximum durability and contrast with the drum surface.

2.3.2.2 Regulatory Marking and Labeling

Federal and State regulations may require specific labeling for IDW generated (i.e., RCRA, TSCA, NESHAPs). Pre-printed labels shall be used as appropriate and completed in accordance with the specific regulatory requirement. These requirements will be identified in the approved project plans. Once determined to be hazardous, weekly inspections must also be conducted to ensure that labels and markings are in good conditions and to ensure the integrity of containers.

In addition, prior to off-site transportation USDOT requirements for marking and labeling of regulated DOT materials must be complied with. These requirements will be identified in the approved project plans or otherwise coordinated with the Field Manager after the IDW has been characterized and off-site disposition is being planned. Note that personnel (i.e., contractors or subcontractors) who perform USDOT functions must be properly trained in accordance with 49 CFR 172, Subpart G.

2.4 DRUM STORAGE

Drum storage procedures shall be implemented to minimize potential human contact with the stored IDW and prevent extreme weathering of the stored drums. Waste accumulation areas will be pre-designated by NAVFAC NW prior to the start of site work. IDW drums should be placed on pallets. Good management practices should be used in storing drums which include: containers shall be in good condition and closed during storage; wastes must be compatible with containers; where liquids are stored, storage areas should have secondary containment; and spill or leaks should be removed as soon as possible. These good management practices are mandatory requirements where RCRA hazardous wastes are stored.

Waste accumulation areas shall be maintained as prescribed by local regulatory entities and the appropriate Naval installation. In general, drums of IDW shall be stored within the Area of Concern (AOC) so that the site can utilize RCRA regulatory flexibility (i.e., administrative requirements, such as 90-day storage, may not be triggered; and LDRs will not be triggered if IDW is placed back in AOC). If IDW is determined to be RCRA hazardous waste, then RCRA storage, transportation and disposal requirements must be met.

Drums shall be stored at identified waste accumulation areas. All IDW drums generated during field activities at a single AOC shall be placed together, in a secure, fenced onsite area to prevent access to the drums by unauthorized personnel. When a secure area is not available, drums shall be placed in an area of the site with the least volume of human traffic. Plastic sheeting (or individual drum covers) and yellow caution tape shall be placed around the stored drums. Drums from projects involving multiple AOCs should remain at the respective source areas where the IDW was generated. IDW should not be transferred offsite for storage elsewhere, except under rare circumstances, such as the lack of a secure storage area onsite.

Proper drum storage practices shall be implemented to minimize damage to the drums from weathering and possible exposure to humans or the environment. When possible, drums shall be stored in dry, shaded areas and covered with impervious plastic sheeting or tarpaulin material. Every effort shall be made to protect the preprinted drum labels from direct exposure to sunlight, which causes ink on the labels to fade. In addition, drums shall be stored in areas that are not prone to flooding. The impervious drum covers shall be appropriately secured to prevent dislodging by the wind. It may be possible to obtain impervious plastic covers designed to fit over individual drums; however, the labeling information shall be repeated on the outside of these opaque covers.

Drums in storage shall be placed with sufficient space between rows of drum pallets and shall not be stacked, such that authorized personnel may access all drums for inspection. Proper placement will also render subsequent IDW screening, sampling, and disposal more efficient. It is recommended that IDW drums be segregated in separate rows/areas by matrix (i.e., soil, liquid or PPE/other).

If repeated visits are made to the project site, the IDW drums shall be inspected to clear encroaching vegetation, check the condition and integrity of each drum, check and replace labels as necessary, and replace or restore protective covers.

2.5 DRUM INVENTORY

Accurate preparation of an IDW drum inventory is essential to all subsequent activities associated with IDW drum tracking and disposal. An inventory shall be prepared for each project in which IDW is generated, stored, and disposed of. Naval installations and local regulatory authorities may have specific requirements associated with waste inventory and these requirements should be included in the planning process and documented in the WP, FSP, and WMP.

The drum inventory information shall include 11 elements that identify drum contents and indicate their fate.

2.5.1 Navy Activity (Generator)/Site Name

Inventory data shall include the Navy activity and the site name where the IDW was generated (e.g., NASWI, NBK Bangor, etc.).

2.5.2 DO Number

Inventory data shall include the contract and delivery order number associated with each drum (e.g., 0089).

2.5.3 Drum Number

The drum number assigned to each drum shall be included in the inventory database.

2.5.4 Storage Location Prior to Disposal

The storage location of each drum prior to disposal shall be included in the inventory (e.g., Building 394 Battery Disassembly Area, or Adjacent to West end of Building 54).

2.5.5 Origin of Contents

The source identification of the contents of each IDW drum shall be specified in the inventory (e.g., soil boring number, monitoring well number, sediment sampling location, or the multiple sources for PPE- or rinse water-generating activities).

2.5.6 IDW Type

Inventory data shall include the type of IDW in each drum (e.g., soil, PPE, disposable sampling equipment, sludge, sediment, development water, steam cleaning water, decontamination rinse water).

2.5.7 Waste Volume

The amount of waste in each drum shall be specified in the inventory as a percentage of the total drum volume or an estimated percentage-filled level (e.g., 95% maximum for liquid IDW).

2.5.8 Recommended Analytical Methods and Test Results Compared with Applicable Regulatory Standards

The recommended EPA analytical methods that adequately characterize IDW contained in each drum will be summarized in a tabular format and attached to the quarterly IDW drum inventory report (see Attachment I-A-7-1). The methodology for sampling and characterizing IDW shall be specified in the appropriate project plans.

2.5.9 Recommended or Actual Disposition of IDW Drum Contents

The recommended means of IDW disposal for each drum shall be summarized in a tabular format (e.g., Offsite, Encapsulated Onsite, Treatment/Sewer, Offsite Incinerator) and attached to the quarterly IDW drum inventory report (see Attachment I-A-7-1). Additional narrative discussion of the rationale for the recommended disposal option shall be attached to the quarterly IDW drum inventory report as data become available.

2.5.10 Generation Date

Inventory data shall include the date IDW was placed in each drum. If a drum contains IDW-generated over more than one day, the start date for the period shall be specified in dd-month-yy format. This date is not to be confused with an RCRA hazardous waste accumulation date (40 CFR 262). The accumulation start date, if required for RCRA wastes, shall be included on the hazardous waste drum label (Section 2.3.2.2).

2.5.11 Expected Disposal Date

The expected date each drum is to be disposed of shall be specified as part of the inventory in month-yy format. This date is for informational purposes only for the Navy, and shall not be considered contractually binding.

2.5.12 Actual Disposal Date

The actual drum disposal date occurs at the time of onsite disposal, or acceptance by the offsite treatment or disposal facility. It shall only be entered in the drum inventory database when such a date is available in dd-month-yy format.

In order to provide information for all 11 of the inventory elements of the quarterly inventory report described above, the main source of information will be provided by RPMs, or their designees, and summarized in Attachment I-A-7-1.

The recommended analytical test methods and actual test results (compared to applicable regulatory standards) will be provided to the appropriate Navy groups, by the RPM, or their designees, when such data are available. Testing methods shall be documented in the associated project plans. Recommended disposal options or actual disposition of the IDW drum contents will also be provided by RPMs as data become available. The NAVFAC Northwest RPM will forward all IDW data to the appropriate Navy authority as attachments to the quarterly IDW drum inventory report. This information constitutes the results of preparing and implementing an IDW screening, sampling, classification, and disposal program for each site.

3.0 DOCUMENTATION

The RPM or designee is responsible for completing and updating the site-specific IDW drum inventory spreadsheet and submitting it as needed. The RPM is also responsible for submitting backup documentation to the U.S. Navy Program Management Office (PMO) about the analytical methods recommended to adequately characterize the IDW in each drum (Section 2.5.8). In addition, actual site or drum sampling results shall be forwarded to the PMO, along with a comparison to the applicable regulatory standards, for inclusion as attachments to the quarterly IDW drum inventory. As necessary, the backup documentation to the quarterly IDW drum inventory report shall also include the recommended means for IDW disposal for each drum (Section 2.5.9). After disposal, the actual means and/or location of disposal shall be indicated in tabular format with supporting narrative.

Field Managers and designates are responsible for documenting all IDW-related field activities in the field notebook, including most elements of the IDW drum inventory spreadsheet. The correct methods for developing and maintaining a field notebook are presented in SOP III-D, *Logbooks*.

Upon receipt of analytical data from the investigation, the information will be forwarded to the appropriate Naval authority for comparison to regulatory waste criteria. The Navy will designate the IDW and disposal options will be assessed based on the waste designation, approved transport/disposal facilities, and schedule for disposal. Naval installations may have additional requirements for reviewing analytical data, characterizing waste materials, transporting and off-site disposal. The RPM shall coordinate with the Naval installation early in the planning process to ensure that these requirements are properly identified, incorporated into the approved project plans, as available, and implemented in the field.

The disposal of IDW must be approved by the Navy and, in some cases, pertinent regulatory agencies. The disposal must be documented.

4.0 REFERENCES

Department of Transportation (DOT), Hazardous Materials Transportation Regulations, 49 CFR Parts 171 – 179.

EPA. 1998. EPA530-F-98-026, Management of Remediation Waste Under RCRA

EPA. 1991. Management of Investigative-Derived Wastes During Site Inspections. U.S. Environmental Protection Agency/540/G-91/009. May.

EPA. 1992. Guide to Management of Investigative-Derived Wastes. Quick Reference Guide. U.S. Environmental Protection Agency: 9345.3-03FS. January.

5.0 ATTACHMENTS

Attachment I-A-7-1 Example Format – Quarterly IDW Drum Inventory Updates

Attachment I-A-7-1
Quarterly IDW Drum Inventory Updates

Navy Activity / Site Name (Generator Site)	DO Number (0bbb)	Drum Number (xxxx-AA-Dzzz)	Drum Storage Location	Origin of Contents (Source ID #)	IDW Type	Waste Volume (Fill level %)	Waste Generation Date (dd-mm-yy)	Expected Disposal Date (mm-yy)	Actual Disposal Date (dd-mm-yy)
NSC Pearl Harbor/ Landfill	0068	0068-LF-D001	NSC, Bldg 7	SB-1	Soil Cuttings	100	16-Dec-92	Dec-93	Na
		0068-LF-D002	NA	MW-1	Purge Water	75	20-Dec-92	Jul 93	26-Jul-93
				MW-2					
				MW-3					
		0068-LF-D003	NA	MW-1	Decon Water	95	20-Dec-92	Jul-93	26-Jul-93
				MW-2					
				MW-3					
		0068-LF-D004	NSC, Bldg.16	SB-1	PPE	50	16-Dec-92	Oct-93	NA
				SB-2					
				SB-3					
				SB-4					
				MW-1					
				MW-2					
				MW-3					
NAVSTA Guam/ Drum Storage	0047	0047-DS-001	Hazmat Storage Area	SB-1	Soil Cuttings	100	18-Feb-93	Sep-93	NA
				SB-2					

NA = Not Applicable

GENERAL FIELD OPERATION

1.0 PURPOSE

This standard operating procedure (SOP) defines the general field organization and the field structure of sample collection, sample identification, record keeping, field measurements, and data collection. These SOPs are used to ensure the activities used to document sampling and field operations provide standardized background information and identities.

2.0 PROCEDURES

2.1 MOBILIZATION/DEMOBILIZATION

The SM or designee ensures that all purchase requests have been reviewed and approved by the PM. Then, the SM and PM assemble the project team in order to review the scope of work, disseminate the project plans, and complete the field equipment checklist (provided as Attachment I-A-9-1). After review by the project team, if additional items are required, additional purchase requests are prepared and approved by the PM.

The SM and project team upon arrival at the site inspects all equipment. Packing slips, bills of lading, or other documentation received with the shipment are initialed and returned to the purchasing department and a copy placed into the field file. Quantities, types, and makes of items received are checked against the original purchase requests to validate the shipment. Prior to validation of the shipping receipt, equipment is inspected to ensure all components are present and that the equipment calibrates and is fully functional. Any equipment received that is not fully functional is returned immediately and the vendor contacted to arrange a replacement.

The SM provides copies of the appropriate SOPs to the project team prior to the start of field activities. The most current versions of the SOPs are brought to the field. Any revisions to the SOPs must be approved by the PM and recorded in the field logbook.

It is imperative that rental equipment be cleaned (decontaminated), packaged, and returned immediately following the completion of a task. If any problems occurred on site with any equipment, the problems should be noted in detail in the field logbook and the SM notified. The SM will forward this information to the purchasing department and the vendor.

2.2 SHIPPING

If it is possible and /or practical, equipment and supplies should be shipped directly to the field site. If sensitive field equipment is to be shipped to the site, care shall be taken to ensure the equipment is not damaged en route. All original packaging material should be retained for return shipment of the equipment. Additional packing material (e.g., bubble wrap, bubble bags) may be required to provide additional protection for the shipped items. Equipment should always be shipped in its original carrying case. Each piece being shipped must have an address label on the shipping container separate from the shipping air bill.

2.3 CHAIN OF COMMAND

Chain of command protocols are implemented by the PM. These protocols should be strictly followed while performing field tasks. All decisions concerning priorities, project team assignments, sampling procedures, equipment management, and task approach are made by the

PM, the SM, or an approved appointee. The SM or an approved designee will conduct a daily meeting prior to the start of field activities to discuss individual responsibilities. The meeting will also address potential contaminants that may be encountered, safety items (such as use of heavy equipment or protection against noise), special sampling requirements, and site control(s) to be employed to prevent injuries or exposure.

2.4 SAMPLING ORGANIZATION

The SM ensures the sampling design, outlined in project plans, is followed during all phases of the sampling activities at the site. For each sampling activity, field personnel record the information required by the applicable SOPs in their logbooks and on the exhibits provided in the SOPs.

2.5 REVIEW

The PM, SM, and, on occasion, the QAO or an approved designee checks field logbooks, daily logs, and all other documents that result from field operations for completeness and accuracy. Any discrepancies on these documents are noted and returned to the originator for correction. The reviewer acknowledges that review comments have been incorporated into the document by signing and dating the applicable reviewed documents.

3.0 DOCUMENTATION

Project activities shall be recorded in the field logbooks. The logbooks shall be kept current for the daily activities including documentation of all samples collected and the information relevant to the sample collection. All project required field forms shall be completed within a timely manner upon completion of the field task. All required field forms and specific logbook notations should be detailed in the field sampling plan.

4.0 REFERENCES

None.

5.0 ATTACHMENTS

Attachment IA91	Field Equipment Checklist.

Attachment I-A-9-1
Field Equipment Checklist

General

___ 1. Health and Safety Plan
___ 2. Site base map
___ 3. Hand calculator
___ 4. Brunton compass
___ 5. Personal clothing and equipment
___ 6. Personal Protective Equipment (First Aid kit)
___ 7. Cell or radio telephone

Environmental Monitoring Equipment

___ 1. Shovels
___ 2. Keys to well caps
___ 3. pH meter (with calibrating solutions)
___ 4. pH paper
___ 5. Thermometer
___ 6. Conductivity meter (with calibrating solution)
___ 7. Organic vapor analyzer or photoionization detector with calibration gas
___ 8. H2S, O2, combustible gas indicator
___ 9. Draeger tubes

Shipping Supplies

___ 1. Sample preservatives (nitric, hydrochloric, sulfuric acid/sodium hydroxide)
___ 2. Heavy-duty aluminum foil
___ 3. Coolers
___ 4. Ice packs
___ 5. Large zipper locking plastic bags
___ 6. Heavy-duty garbage bags
___ 7. Duct tape
___ 8. Strapping tape
___ 9. Paper towels
___ 10. Bubble pack, foam pellets, or shredded paper
___ 11. Vermiculite
___ 12. Cooler labels (“This Side Up,” “Hazardous Material,” “Fragile”)
___ 13. Federal Express/DHL labels

Sampling Equipment

___ 1. Tool box with assorted tools (pipe wrenches, screwdrivers, socket set and driver, open and box end wrenches, hacksaw, hammer, vice grips)
___ 2. Geologic hammer
___ 3. Trowel
___ 4. Stainless steel and/or Teflon spatula
___ 5. Hand auger
___ 6. Engineer’s tape
___ 7. Steel tape
___ 8. Electric water level sounder
___ 9. Petroleum Interface Probe
___ 10. Batteries
___ 11. Bailers (Teflon, stainless steel, acrylic, PVC)
___ 12. Slug test water displacement tube
___ 13. Vacuum hand pump
___ 14. Electric vacuum pump
___ 15. Displacement hand pump
___ 16. Mechanical pump (centrifugal, submersible, bladder)
___ 17. Portable generator
___ 18. Gasoline for generator
___ 19. Hose
___ 20. Calibrated buckets
___ 21. Stop watch
___ 22. Orifice plate or equivalent flow meter
___ 23. Data logger and pressure transducers
___ 24. Strip chart recorders
___ 25. Sample bottles
___ 26. 0.45-micron filters (prepackaged in holders)
___ 27. Stainless steel bowls
___ 28. SW scoop
___ 29. Peristaltic pump/tubing
___ 30. Sample tags
___ 31. SOPs, HAZWOPER training certificates, MSDs, FSP, QAPP

Decontamination Equipment

___ 1. Non-phosphate laboratory-grade detergent
___ 2. Selected high purity, contaminant free solvents
___ 3. Long-handled brushes
___ 4. Drop cloths (plastic sheeting)
___ 5. Trash container
___ 6. Galvanized tubs or equivalent (e.g., baby pools)
___ 7. Tap Water
___ 8. Contaminant free distilled/deionized water
___ 9. Metal/plastic container for storage and disposal of contaminated wash solutions
___ 10. Pressurized sprayers, H_2O
___ 11. Pressurized sprayers, solvents
___ 12. Aluminum foil
___ 13. Sample containers
___ 14. Emergency eyewash bottle
___ 15. Documentation Supplies

Documentation Supplies

___ 1. Weatherproof, bound field logbooks with numbered pages
___ 2. Daily Drilling Report forms
___ 3. Field Borehole Log forms
___ 4. Monitoring Well Installation Log forms
___ 5. Well Development Data forms
___ 6. Groundwater Sampling Log forms
___ 7. Aquifer Test Data forms
___ 8. Sample Chain-of-Custody forms
___ 9. Custody seals
___ 10. Communication Record forms
___ 11. Documentation of Change forms
___ 12. Camera and film
___ 13. Paper
___ 14. Permanent/indelible ink pens
___ 15. Felt tip markers (indelible ink)
___ 16. Munsell Soil Color Charts

MONITORING/SAMPLING LOCATION RECORDING

1.0 PURPOSE

This standard operating procedure (SOP) describes the guidelines for generating the descriptions and information to be recorded for each physical location where monitoring, or sampling is conducted.

2.0 PROCEDURES

2.1 SAMPLING LOCATION MARKING

Sampling locations are based on criteria presented in the SAP. Whenever possible, each sampling location will be marked by a wooden lathe stake, directly marking the surface with marking paint, or with surveyors flagging. Each should be labeled with the location identifier outlined in the SAP. This should be done during the site visit or as soon as is feasible during field activities. This is to give the utility locators a better idea of the specific area to be cleared. Having the locations marked will also assist the field crew gain a better perspective of the locations to be worked

2.2 PHOTOGRAPHIC DOCUMENTATION

Site photographs showing monitoring/sampling locations with respect to structures or the site in general are encouraged. At certain installations, photography must be approved by the Navy. Prior to commencing work, the Navy must be notified to determine if cameras are allowed at the installation. The Note that the Navy will likely inspect your camera and may purge/delete some pictures if they feel there is a security issue. When possible, a menu board included in the photograph can be used to give relative information regarding the project and location.
For each photograph, record the following information in the field logbook:

- Photo number
- Date and time of the photo
- Orientation of the photo (direction facing)
- Subject-a description of what is contained within the photo. Others may be using the photos that are unfamiliar with the site and locations.

A detailed description of field logbook entries can be found in SOP III-D, *Logbooks*.

2.3 MONITORING/SAMPLING LOCATION INFORMATION FORM

A Monitoring/Sampling Location Information form must be filled out to establish each new sampling location. This form must be provided to the Navy for inclusion into the NAVFAC NW NIRIS Database. Established locations should not be re-established unless new information (such as survey information) is recorded about a location. A location description may be provided about a sampling location. It should contain detailed information regarding the physical features surrounding the location, including relevant site information (i.e., obvious contamination, measurements to physical features, topographical relief, etc.). This description may be a copy of the field logbook or notes on project plan maps. These descriptions shall be attached to the field form. The PM is responsible for insuring that the project personnel have and use consistent terminology and descriptions as established in the SAP. The reverse of the field form contains a brief discussion of the form and descriptions of the information requested on the front.

3.0 DOCUMENTATION

None.

4.0 REFERENCES

SOP III-D, *Logbooks*

5.0 ATTACHMENTS

Attachment IA101 Example Monitoring/Sampling Location Information Form

FORM 11-1A
MONITORING/SAMPLING LOCATION SUMMARY

Installation ID:
Establishing Contract ID:
Prime Contractor Name:
Site Name:
DO/CTO:
Establishing Phase:
Date Established:
Survey Contractor:
Local System Description:

Location Name	Location Type	Projection Specification	Coordinates		Ground Elevation (feet msl)
			Northing (feet)	Easting (feet)	

Location Types

ACID	Acid Pit
ADIT	Adit
AGT	Above ground tank
AIR	Air (not inside a building - ambient conditions)
AMB	Ambient drinking water aquifer monitoring well
AOVM	Ambient organic vapor monitor
ASBTS	Asbestos-Containing Area
BAY	Bay
BF	Backfill
BH	Borehole/Soil boring
BIN	Roll-off bin
BIOL	Biological (plant or animal)
BLDG	Building (includes building air and building materials)
BULK	Bulk sample
BURN	Burn pit
CB	Concrete boring
CENT	Location surveyed at the center of a UST field
CLGP	Canal Level Gauging Point
CPT	Cone penetrometer
CY	Cryopile
DCON	Decontamination pad
DITCH	Channel/Ditch
DP	Direct Push/Geoprobe
DRN	Drain
DRUM	Drum/Container contents
DRW	Drywell
DU	Decision Unit
DW	Domestic well
D_RIG_W	Drill Rig Fluid Container
EC	Electrode
ECT	Electrode
EF	System effluent
EVAP	EVAPORATION POND
EXCV	Excavation
FAGT	Former above ground tank location
FL	Fuel line
FLOOD	Flood Plain
FLOOD_GATE	Flood Control Gate
FLOOR	Floor
FLOOR_SCRP	Floor scrapings
FW	Faucet/Tap/Spigot
GAGE	Gaging station (not USGS)
GW	Geoprobe well
GWTH	Groundwater Test Hold
HA	Hand auger
HDPCH	Hydropunch
HOLE	Hole
HP	Holding pond/Lagoon
ID	Indoors
IMP	Import material
IN	System influent
IT	Intertidal
LAGOON	Lagoon
LENTIC	Freshwater, lentic
LF	Landfarm
LGV	Landfill Gas Vent
LH	Leachate (Landfill)
LK	Lake/pond/open reservoir
LOTIC	Freshwater, lotic
LYS	Lysimeter
MH	Manhole/Catch basin
MS	Sediment e.g., Marine Sediment
NQ	Quality Control sample
ON	Ocean, open water (not bay)
OTHER	Other
OUTFALL	Outfall
OW	Oil-Water Separator
PARK	Plantation/park/forest
PC	Paint chip
PIPE	Pipeline
PUBW	Public drinking water well
PUMP_STATN	Pumping station
RAIN_STATN	Rainfall station
REF	Reference
RES	Residential garden/yard
RV	River/stream
RW	Recovery well
SBAG	Soil bag
SE	Seep
SG	Soil Gas Probe
SIDEW	Side Wall
SLAG	Slag heap
SND_BLST	Sandblast material pile
SP	Spring/Seep
SPT	Septic tank
SR	Sewer System
SS	Ground surface
STEAM_LN	Steam Line
STKP	Stockpile
STRM_DRN	Storm drain
STRM_MH	Storm drain manhole
SUBS	Ground, sub-surface
SUBSLAB	Subslab
SUBT	Subtidal
SUMON	Survey monument
SUMP	Sump
SV	Soil vapor extraction system
SWS	Surface water body - nonspecific
SWSD	Surface Water/Sediment
SWWP	Wipe
SYSTEM	Treatment system air or water
T	Trench
TAA	Temporary accumulation area
TAIL	Mine tailings pile
TK	Tank
TMPM	Temperature Monitoring Point
TP	Test Pit
TRANS	Transformer
TUNNEL	Steam tunnel sampling location
TWP	Temporary well point
UGA	Geophysical anomaly
UNK	Unknown
USGS	USGS gauging station
UST	Underground storage tank
UXO	UXO
UXO_G	UXO grid
UXO_P	UXO point
VAULT	Vault
VPB	Vertical profile boring
WALL	Wall
WEEP	Weep hole
WF	Waste water treatment facility
WL	Well
WLAM	Alluvial Monitoring Well
WLBM	Bedrock Monitoring Well
WLE	Extraction well
WLEA	Alluvial Extraction Well
WLEB	Bedrock Extraction Well
WLHM	Hybrid Monitoring Well
WLI	Injection well
WLIA	Alluvial Injection Well
WLIM	Interface Monitoring Well
WLL	Leaching Well
WLM	Monitoring well
WLS	Sparge well
WLSG	Soil gas probe/Well
WRP	Waste rock pile
WSFI	Water system facility intake
WT	Wetlands
WW	Waste water

Recorder: ______________________________ Date: __________

Checker: ______________________________ Date: __________

SAMPLE NAMING

1.0 PURPOSE

This standard operating procedure (SOP) describes the naming convention to be used for samples collected, analyzed, and reported for the U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) projects. Unique sample identifiers are used to facilitate tracking by laboratory and project personnel and for purposes of storing, sorting, and querying data in the NAVFAC NW NIRIS database.

2.0 PROCEDURES

The contractor is responsible for assigning a unique sample ID to every individual sample collected. The contractor may use his or her own designations as long as the sample ID does not already exist in the NIRIS database. The contractor must also clearly identify which samples are field duplicates. This applies to both historical and planned sampling events. The used sampling identification scheme shall be identified and outlined in the field sampling plan.

3.0 DOCUMENTATION

All sample collection information must be recorded within the field logbook. Each sample collected will be clearly associated with the sample location (installation, site, and well or sample point location), matrix type, sample type (i.e. environmental, field duplicate, equipment rinsate), collection date and time, sampling method, and sampling depth (if appropriate). Only data codes and location IDs associated with NIRIS and NAVFAC NW's electronic deliverables SOP (NAVFAC NW 2015) shall be used.

Any sample submitted for analysis shall be documented using a completed chain-of-custody (COC) form that must accompany the shipment and a copy retained for the project records. Samples submitted to an EPA laboratory shall also include a completed EPA analysis request form. The COC/analytical request form must be used to track all sample IDs.

4.0 REFERENCES

NAVFAC NW. 2015. Navy Environmental Data Transfer, Version 5.0.

5.0 ATTACHMENTS

None.

SEDIMENT SAMPLING

1.0 PURPOSE

This standard operating procedure (SOP) describes the methods by which U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) field personnel and their contractors will conduct subareal or subaqueous sediment sampling. This procedure establishes the guidelines for both conventional and undisturbed sediment sample collection and sample containerization with a variety of sampling devices. Sediment compositing and methods of preventing sample and equipment cross-contamination are also included.

Proper sediment sampling ensures that any evaluations of sediment or catchment contamination are based on actual chemical concentrations and are not an artifact of improper sampling techniques.

2.0 PROCEDURE

Project Objectives and/or the Project Plan must be carefully considered when the sediment sampling method is determined. This procedure covers the following methods for sampling sediments in both subareal and subaqueous environments.

2.1 EQUIPMENT

Typical field sampling equipment and material used for sediment sampling include:

- Sampling Plan
- Maps/Site Drawings
- Tape measure
- Survey stakes, flags, or buoys
- Camera and film
- Stainless steel ruler
- Stainless steel, plastic, or other appropriate composition (e.g., Teflon) bucket
- Garden Sprayer
- Bucket for investigative derived waste
- Appropriate Sample Containers

- Packing material for sampling containers
- Ziploc® plastic bags for samples, and sample jars
- Rite in the Rain Logbook
- Disposable gloves (nitrile, vinyl)
- Sample Labels
- Chain-of-Custody Forms
- Field Sample Description Forms
- Cooler(s)
- Ice
- Decontamination supplies/equipment
- Spatula
- Scoop
- Trowel
- Nylon rope
- Sediment sampling device/support equipment

2.2 SUBAREAL SEDIMENT SAMPLING METHODOLOGY

2.2.1 Sampling Surface Sediments with Trowels or Scoops

Collection of surface sediment with no overlying water or from beneath a thin aqueous layer can be accomplished with tools such as spades, shovels, and scoops. The surface material can be removed to the required depth; then a stainless steel or plastic scoop should be used to collect the sample. This method can be used to collect consolidated sediments, but is limited somewhat by the depth of the aqueous layer. Accurate, representative samples can be collected with this procedure depending on the care and precision demonstrated by the sampling technician. A stainless steel or plastic scoop or lab spoon will suffice in most applications. Care should be exercised to avoid the use of devices plated with chrome or other materials. Plating is particularly common with garden implements such as planting trowels.

The following procedure will be used to collect the sediment samples:

- Using a pre-cleaned stainless steel scoop or trowel, remove the desired thickness of sediment from the sampling area.

- Provide a characterization of the sediments including observations on sediment color, odor, stratification, texture, consistency, presence of organisms, and distinguishing characteristics (debris or other anthropogenic material).

- Transfer sample into an appropriate sample container.

2.2.2 Sampling Surface Sediments with a Hand Auger

This system consists of an auger, a series of extensions, and a T-handle. The auger is driven into the sediment and used to extract a core. A sample of the core is taken from the appropriate depth.

The following procedure will be used for collecting sediment with a thin-walled auger:

- Insert the auger into the material to be sampled at a 0° to 45° angle from horizontal. This orientation minimizes the spillage of sample from the sampler. Extraction of samples may require tilting of the containers.

- Rotate the T-handle once or twice to cut a core of material.

- Slowly withdraw the auger, making sure that the slot is facing upward.

- An acetate core may be inserted into the auger prior to sampling if characteristics of the sediments or body of water warrant. By using this technique, an intact core can be extracted.

- Transfer sample into an appropriate sample or homogenization container.

2.2.3 Sampling Deep Sediments with Augers and Thin-Wall Tube Samplers

This technique consists of an auger, a series of extensions, a T-handle, and a thin-wall tube sampler. The auger is used to bore a hole to a desired sampling depth and then withdrawn. Next, the auger tip is replaced with a tube core sampler, lowered down the borehole, and driven into the sediment at the completion depth. The core is withdrawn and the sample collected. This method can be used to collect consolidated sediments, but is somewhat limited by depth of the aqueous layer.

Several augers are available, including bucket and posthole augers. Bucket-type augers are better for direct sample recovery, are easy to use, and provide a large volume of sample. Posthole augers have limited utility for sample collection because they are designed for their ability to cut through fibrous, rooted materials.

The following procedures will be used for collecting sediment samples with the hand auger:

- Attach the auger bit to a drill rod extension, and then attach the T handle to the drill rod.

- Clear the area to be sampled of any surface debris (e.g., twigs, rocks, litter).

- During augering, periodically remove any accumulated sediment from the auger bucket.

- After reaching desired depth, slowly and carefully remove auger from the boring. When sampling directly from the auger, collect the sample after the auger is removed from the boring and transfer the sample to the appropriate containers.

- Remove the auger tip from the drill rods and replace it with a clean thin-wall tube sampler. Install proper cutting tip.

- Carefully lower the tube sampler down the borehole. Gradually force the tube sampler into the sediment. Care should be taken to avoid scraping the sides of the borehole. Avoid hammering the drill rods to facilitate coring because the vibrations may cause the boring walls to collapse.

- Remove the tube sampler and unscrew the drill rods.

- Remove the cutting tip and remove the core from device.

- Discard the top of core (approximately one inch), because it represents material collected by the tube sampler before penetration of the layer in question.

- Transfer the sample into an appropriate sample container.

2.3 SUBAQUEOUS SEDIMENT SAMPLING METHODOLOGY

Subaqueous samples may be recovered using a variety of methods and equipment, depending on the depth of the aqueous layer, the portion and depth of the sediment profile required (surface vs. subsurface), the type of sample required (disturbed vs. undisturbed), and the sediment type. Types of subaqueous sampling devices include grab samplers, box cores, dredges and coring devices. Grab samplers and box cores are typically used to collect surficial sediments for the assessment of the horizontal distribution of sediments. Dredge samplers also collect surficial sediments but can cause disruption of sediment and pore water integrity, as well as loss of fine-grained sediments. Core samplers (e.g., vibracore) are used to characterize the vertical distribution of sediment characteristics or to characterize the entire sediment column.

2.3.1 Grab Samplers

Grab samplers consist of a set of jaws, which close on bottom contact through a spring action or by cable pull. Grab samplers are generally small and manageable from a small boat using a davit or boom. A deck winch usually assists deployment and retrieval. Types of grab samplers include a van Veen, Ponar, Smith-McIntyre and Birge-Ekman and Box core.

2.3.1.1 Van Veen Sampler

To minimize the loss of fine-grained material during collection in sub-tidal environments, marine surface sediments will be collected using a 0.1-m^2 stainless-steel van Veen sediment sampler. In areas where use of the van Veen grab sampler is infeasible, a Birge-Ekman, Ponar, Smith-McIntyre, or other acceptable grab sampler will be used.

- Sediments from the 0- to 4-cm horizon will be collected unless directed otherwise in the project plans.

- Weights may be added to the sampler to increase penetration and assure the proper horizon thickness, or removed from the sampler to prevent overfilling in soft sediments.
- When the survey vessel is positioned, the van Veen sampler will be lowered near the bottom at a rate not exceeding 30 cm (1 ft.) per second to avoid pre-tripping the grab and preventing loss of fine-grained surface sediments from the bow wave created in front of the grab.
- At the instant the sampler impacts the bottom (detectable when the lowering wire slackens); a position fix will be taken.
- The sampler will be retrieved at a slow speed, so as not to disturb the grab.
- Once the sampler is secure on the processing stand, the sampler and grab will be observed for signs of overfilling, inadequate penetration, or grab disturbance.

The following acceptability criteria should be satisfied:

- Sediment is not extruded from the upper face of the sampler such that sample material may have been lost
- Overlying water is present (indicates minimal leakage)
- The grab surface is relatively flat (indicates minimal disturbance or winnowing)
- The entire surface of the grab is included in the sampler
- The following penetration distances are achieved at a minimum
    - 4 to 5 cm for medium-coarse sand
    - 6 to 7 cm for fine sand
    - Greater than or equal to 10 cm for muddy sediment
- There is no evidence of sediment loss (incomplete closure of sampler, penetration at an angle with the bottom, or tilting upon retrieval).

Should any of these conditions be observed, the grab will be discarded and the drop repeated. For all acceptable grabs, the overlying water will be removed with a siphon tube and the sampler penetration will be measured. The first grab of a unit will be characterized fully, including observations on sediment color, odor, stratification, texture, consistency, presence of organisms, and distinguishing characteristics (debris or other anthropogenic material). Other grabs in the unit will be examined and differences will be noted, but the subsequent grabs will not be fully characterized. Under the direction of the technical lead, organisms, debris, and other material unrepresentative of sediments will be removed from the grab; such material will be described and documented in the field log.

2.3.1.2 Birge-Ekman Sampler

The following procedures will be used for collecting sediments with a Birge-Ekman Sampler:

- Attach a sturdy nylon or stainless steel cable to the hook provided. For relatively shallow depths, secure the extended handle to the bracket with machine bolts.
- Arrange the Birge-Ekman sampler so that the jaws are in the open position and trip cables are positioned over the release studs.
- Lower the sampler to a point just above the sediment surface.
- Drop the sampler sharply onto the sediment.
- Trigger the jaw release mechanism by lowering a messenger down the line, or by depressing the bottom on the upper end of the extended handle.
- Raise the sampler and slowly decant any free liquid through the top of the sampler by slowly inclining the sampler and collecting the escaping water in a bucket or other suitable container.
- Open the dredge and transfer the sediment into a stainless steel or plastic bucket. Continue to collect additional sediment until sufficient material has been secured. Transfer the sediment to an appropriate sample container.
- Collect samples for volatile organic analysis directly from the bucket to minimize volatilization of contaminants.

2.3.1.3 Box Core

The box core sampler consists of an open bottom stainless steel rectangular box mounted on the end of a sturdy sliding vertical bar. On contact with the bottom, a swing arm closes over the end of the sampler and the unit is raised to the surface. The box core is much heavier (500 lbs.) than the typical grab samplers and is capable of deeper sediment penetration and larger sample volume recovery. The steps for deploying a box core typically include:

- Prior to installing the stainless steel rectangular box in the box core frame assembly, it will be thoroughly decontaminated. In locations with obvious contamination, the interior of the grab sampler should be washed with soap and water and rinsed with potable water.
- The closure plate pivot arm is moved to the horizontal position and the safety rod(s) are inserted into the frame assembly to prevent pre-tripping the mechanism.
- An appropriate amount of weight should be added to the main frame assembly if previous sampling attempts yield insufficient sample penetration.
- The rectangular sampling box is then mounted into position on the main frame.
- Each sampling location should have established coordinates that will be located using a differentially corrected GPS (DGPS) or appropriate field positioning system that provides suitable accuracy (± 3 to 5 m). A marker float may be deployed at the station coordinate to facilitate the reoccupation of the site should additional grabs be required.

- At the desired sample location, the box core is gently positioned outboard of the vessel, and the safety rods are removed.
- The sampler will descend in the water column at a rate no faster than 1 foot per second to omit the creation of a bow wave.
- On contact with the bottom (denoted by slackness in the lowering line), the box core will be slowly raised to the surface so as not to disturb the collected sediment.
- Once the box core is secured on deck, a stainless steel cover plate is inserted between the pivot arm closure plate and the bottom of the rectangular sample box, and then attached in place by either screws or clamp mechanisms.
- The sample box is then detached from the frame assembly and moved in the upright position to a processing location.
- When the recovered sampler is placed on a secure processing stand, the contents of the grab will be inspected for acceptability (Section 2.3.1.1).

When a grab is deemed unacceptable, the contents will be discarded, the box core will be rinsed with site water and the grab repeated. When an acceptable grab is obtained, the following information shall be included in the field log.

- The water depth of the grab. Be sure the boat depth sounder has been offset to represent the water surface.
- Time the box core sampler impacts the bottom
- The penetration depth of the box core sampler in the sediment (centimeters)

Prior to processing of an acceptable grab, the overlying water should be removed with a siphon tube, being careful not to siphon off the upper layer sediments. Remove any large organisms, debris and other material unrepresentative of the sediments and document it in the field log. The grab contents should be thoroughly described before collecting the sediments for chemical analysis. The sediment should be characterized by color according to a Munsell color scale, sediment odor, sheen, stratification, texture, consistency, and presence of organisms and distinguishing characteristics. If necessary, additional grab samples at each location may be required to obtain the required sample volume.

2.3.2 Dredges

The types of devices include Emery and Peterson dredges. The closing mechanism on the dredge buckets will be activated either by impact or by a weighted messenger sent down the deployment line. After the bucket is closed, the sampler is retrieved by hand or with a motorized winch. Dredges will be deployed and recovered following the procedures outlined in Section 2.3.1.1.

2.3.3 Core Samplers

2.3.3.1 Core Logging

The sediment core is usually processed at an established shore facility in order to describe its structure and create subsamples for chemical analysis. It is important to document the core content and to maintain sample quality. Prior to inspection of the samples, the unlined core tubes or plastic core liners are cut lengthwise. This is accomplished using electric reciprocating saws for the thick walled tubes and hooked bladed knives for the thin walled plastic liners. However, Lexan plastics are very tough, and cutting with a razor knife can be dangerous and difficult to control without cutting into the core.

Once the upper portion of the core tube cover is removed, a clean knife or spatula should be used to expose an outer portion of the core that was not in contact with the core liner. Care should be taken that the blade is not introducing contaminants into other segments of the recovered core. Prior to describing the core, a moveable light is positioned and a tape measure is positioned for the full length of the core.

The core will then be visually described in the core log including the following characteristics:

- Station number
- Date and time of collection
- Station coordinates
- Weather conditions
- Names of persons collecting and logging the sample
- Sample recovery
- Physical soil description in accordance with the Unified Soil Classification System (USCS)
- Odor (e.g., hydrogen sulfide, petroleum)
- Visual stratifications and lenses
- Vegetation
- Debris
- Biological activity (e.g., detritus, shells, tubes, bioturbation, live or dead organisms)
- Presence of oil sheen
- Photograph information (time, direction of photograph, roll number/frame number). Photographs should overlap previous core sections.
- Any other distinguishing characteristics or features

Core samples are acceptable if the core has penetrated to an acceptable depth and the core was inserted vertically.

Collect analytical samples from each core interval, as pre-determined in the SAP, from the undisturbed core interior with a clean, stainless steel spoon or spatula. Place the sediment from an individual core interval into a clean stainless steel mixing bowl. Mix the sediment with a clean stainless steel spoon thoroughly or until visually homogeneous.

2.3.3.2 Piston Core

Guidelines for using a piston core include:

- Field personnel will assemble the hand corer according to the manufacturer's specifications.
- Adjust the clearance so that the piston slides in the barrel with only slight resistance, but is tight enough to create ample suction in the barrel.
- Plastic core sleeves, if used, will be either new or thoroughly decontaminated and placed in the corer according to the manufacturer's specifications.
- Lower the corer to the sediment surface or into the borehole to the desired depth. Once the sampler is positioned at the interval to be sampled, secure the piston line and manually drive the core barrel into the sediment in one slow, continuous effort. Handles can be attached to the drive rods to apply additional force when necessary. Retrieve the corer by manually lifting the sampler to the surface with the drive rods. Repeat this process for each specified core interval.
- If the corer is equipped with a plastic sleeve, the sleeve will be removed, sealed, and labeled when the sampler is retrieved from the sediment. The top of the core will be indicated on the sleeve. If the sample is designated for chlorinated organic testing, special provisions will be made to replace the plastic liners with another non-reactive material.
- If the corer is not equipped with plastic sleeves, extrude the sediment core onto a clean surface lined with plastic wrap and aluminum foil. First, wrap the core with the plastic and foil, being careful not to break or damage the core; then wrap this in aluminum foil so that the ends of the foil are folded over, creating a squared-off end. Tape the foil closed on both ends and along the seam. Affix a piece of tape to the core wrapping and label with the sample interval, date, and sampling personnel. Be sure to indicate the orientation of the core on the label (i.e., top and bottom).
- If the core is to be sampled in the field, use a stainless-steel scoop or spoon to remove the samples from the core at the intervals specified in the project plans, and put the samples into the appropriate containers. Discard any leftover sediment according to the specifications in the project plans.

2.3.3.3 Gravity Core

Gravity corers are capable of collecting soft fine-grained sediments cores at depths up to 3 meters. External weights are added to assist core barrel penetration into the sediments. A variety of liner materials are available including stainless steel, Lexan and PVC plastic liners. Guidelines for the gravity core include:

- Field personnel will assemble the corer according to the manufacturer's specifications.
- New or thoroughly decontaminated nonreactive core barrel liners will be installed per the manufacturer's specifications.
- Attach a strong retrieval line or wire rope to the sampler and lower the sampler at a controlled descent of approximately 1 foot per second. When the sampler penetrates the sediment (indicated by a slack retrieval line), immediately pull the sampler free of the bottom, using an electric or hydraulic winch if available.
- Record the bottom depth to the waterline
- Raise the corer at a controlled ascent rate. Once the corer reaches the water surface measure the length from the top of the core tube to the surface of the recovered sediment in the core. Bring it on board and, if possible, secure it to the deck.
- Label the sleeve to properly identify the sample orientation, sample designation, date, core interval, and sampling personnel.
- If the corer is not equipped with plastic sleeves, extrude the sediment core onto a clean surface lined with plastic wrap and aluminum foil. First, wrap the core in the plastic and foil, being careful not to break or damage the core. Then wrap this in aluminum foil so that the ends of the foil are folded over, creating a squared-off end. Tape the foil closed on both ends and along the seam. Affix a piece of tape to the core wrapping and label with the sample interval, date, and sampling personnel. Be sure to indicate the orientation of the core on the label (i.e., top and bottom).

2.3.3.4 Vibracore

Vibracores are hydraulic, pneumatic or electric powered, mechanical vibrators located at the upper end of a coring tube. The vibrating head induces vertical vibrations onto the coring tube to help penetration into the sediment. Depending on the horsepower rating of the vibrating head and its weight, the core tube is cable of penetrations up to 6 meters in compact sediments (U.S. EPA, 2001).

Vibracoring will be performed following the recommended steps.

- Locate the sampling station with an appropriate field positioning system
- Triple anchor the boat or platform to ensure keeping it on station
- Measure the water depth adjusted to the water line.
- Core liners are inserted in the core barrel and held in place by a cutting tip and will contain a core catcher.

- With an electric or hydraulic winch, suspend and lower the vibracorer slowly until the core contacts the bottom. A measuring tape attached to the top shackle of the vibracore is used to calculate the penetration depth.
- Turn on the vibration head and continue penetration until the unit meets refusal or the core tube is fully buried, ensuring the core tube remains vertical.
- Turn off the vibration head.
- Slowly withdraw the core tube by winch, using the vibration only if extraction is difficult.
- Upon reaching the surface, keep the core tube in a vertical position.
- After removing the core catcher, place a plastic cap on the lower end and tape it in place.
- Using a weighed tape, measure the distance from the top of the sediment tube to the surface of the recovered sediment.
- Drill a small hole at the sediment-water interface to drain off all the water above the sample. Cut this section off and place a cap on the top end and tape it in place.
- Label the upper end of the core with date, time and unique station number. Transfer core ashore to an established processing location or laboratory.
- Protect core from sunlight, heat and physical disturbance as much as possible.

Due to the nature of the sediments, the recovery within the core tube may not be uniform throughout the core sample. Compaction of the sediment core can occur in cohesionless or saturated soils. The friction within the core barrel increases with penetration and the length of the sample present in the core tube. Compaction causes the recovered sediments to be under-represented in the recovered core sample. Field collection of penetration and recovery data allows for the identification of under-represented strata.

Once sampling is complete, the vibracore is retrieved and the core liner removed from the core barrel. The core sample will be examined at each end to verify that sufficient sediment was retained for the particular sample. Overlying water will be siphoned from the core tube. If the sample is acceptable, each end of the tube will be capped and sealed with duct tape. Depending on the length of the core, the core sample may be sectioned prior to processing, and each end capped. All core sections will be labeled with the station number, date, time of collection, depth, and directional arrows indicating the top end. The station number, station coordinates, date and time of collection, field crew, and weather conditions will be recorded in the field log. The cores will be stored on ice aboard the vessel until they are processed either on board the boat or onshore.

2.4 DECONTAMINATION

Decontaminate all equipment before sediment sampling. Decontamination of sediment sampling equipment will follow the recommendations of SOP III-I, *Equipment Decontamination*. Sampling grabs and core barrels and liners will be washed with a laboratory-grade detergent (e.g., Alconox) and water solution, rinsed with potable water, 10 percent dilute nitric acid (if metals analysis is required), and a final distilled water rinse prior to field operations. If organic compounds will be analyzed, a solvent rinse such as isopropyl alcohol or hexane will be used. The equipment will then be allowed to air dry. Liners and core barrels will be capped on each end with foil and core caps to prevent contamination during transit or field operations when not in use. Between stations, the sampling device will be rinsed with ambient water.

Decontamination of sampling implements and processing materials such as stainless steel spoons, bowls, rulers and scoops will involve washing the equipment with a laboratory- grade detergent (e.g., Alconox) and water solution, rinsing with tap or site water (e.g., river, lake, ocean), followed by rinses of potable water, 10 percent nitric acid, a solvent such as isopropyl alcohol or hexane, and a final distilled water rinse. Decontaminated equipment will be wrapped or covered with aluminum foil. Subsampling and processing equipment will be decontaminated before use at each station, and between depth intervals at a location in order to prevent cross contamination of samples.

3.0 COMPOSITING

3.1 COMPOSITING SEDIMENT SAMPLES

Sediment samples which will be members of a composite sample should be homogenized once all aliquots have been combined. Sediment samples that will be analyzed for Volatile Organic Compounds (VOCs) should be collected as grab samples from the desired composite member location or depth and aliquotted into the appropriate sample collection containers. Do not homogenize (mix or stir) samples which will be analyzed for VOCs..

If a composite sample is collected to represent a single location over a depth range (such as with a sediment core) or several locations (such as within a marine grid cell), composite the samples as follows:

1. Follow the procedure specified for each sediment collection method.
2. Place each core segment or grab sample to be included in the composite together in a decontaminated stainless steel bowl as they are collected.
3. After all composite member samples from each location or location depth are collected in the bowl, homogenize the sediment thoroughly with a decontaminated stainless steel trowel or spatula until the sediment color and texture are as uniform as possible.
4. Transfer the composited, homogenized sediment to containers appropriate for the desired analysis.
5. Alternative compositing and homogenization container materials may be employed depending on the analysis parameters. For instance, Teflon containers might be used if composites will only be analyzed for metals and aluminum if only organic compounds analysis will be performed.

3.2 SPLITTING SAMPLES

If samples are to be split and analyzed for the same parameters by different laboratories, fill the sample containers for each analysis systematically, one after another in a consistent manner (i.e., fill the first lab's container, then fill the second lab's container for the first analysis; then go on to the next analysis and fill the first lab's container and then the second lab's container).

4.0 DOCUMENTATION

Keep records of all sampling activities in the field notebook following SOP III-D *Logbooks*. Sample custody should be documented on the chain-of-custody forms following procedures described in SOP III-E *Record Keeping, Sample Labeling, and Chain-of-Custody Procedures*.

5.0 REFERENCES

SOP III-D, *Logbooks*

SOP III-E, *Record Keeping, Sample Labeling, and Chain-of-Custody Procedures*

SOP III-F, *Sample Containers and Preservation*

SOP III-I, *Equipment Decontamination*

USEPA. 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. EPA-823-B-01-002.

6.0 ATTACHMENTS

None.

MONITORING WELL SAMPLING

1.0 PURPOSE

This standard operating procedure (SOP) describes the conventional monitoring well sampling procedures to be used by all U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) personnel and contractors. Low-flow sampling procedures are provided in SOP I-C-5, *Low-Flow Groundwater Purging and Sampling*.

2.0 PROCEDURE

2.1 PURPOSE

This procedure establishes the method for the sampling of groundwater monitoring wells for water-borne contaminants and general groundwater chemistry. The objective is to obtain groundwater samples with as little alteration of water chemistry as possible.

2.2 PREPARATION

2.2.1 Site Background Information

A thorough understanding of the purposes of the sampling event should be established prior to commencing field activities. A review of available data obtained from the site and pertinent to the groundwater sampling should also be conducted. Copies of well logs or summary tables regarding well construction information should be available on-site if possible.
Previous groundwater development and sampling logs give a good indication of well purging rates and the types of problems that may be encountered during sampling, such as excessive turbidity and low well yield. These records should indicate where dedicated pumps are placed in the water column.

2.2.2 Groundwater Sample Analysis Selection

The requisite field and laboratory analyses should be established prior to performing groundwater sampling by the project plans. The types and numbers of quality assurance/quality control (QA/QC) samples to be collected (refer to SOP III-B, *Field QC Samples*) should be specified in the QA plan developed for the site.

2.3 GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling procedures for each well site should include: (1) measurement of depth to groundwater and total depth, (2) assessment of the presence or absence and thickness of an immiscible phase (if required by the project plan), (3) purging of static water within the well and well bore, (4) assessment of purge parameter stabilization, (3) purging of static water within the well and well bore, and (5) obtaining a groundwater sample. Each step is discussed in sequence below. Depending upon specific field conditions, additional steps may be necessary. As a general rule, at least 24 hours should separate well development and well sampling events.

2.3.1 Measurement of Static Water Level Elevation

The depth to water and the total depth of the well should be measured to the nearest 0.01 foot to provide groundwater elevation data, to calculate the volume of water in the well, and to provide information on the integrity of the well (e.g., identification of siltation problems). Delete extra space depending upon individual project requirements, synoptic water level collection may be required prior to groundwater sampling activities. Each well should be marked with a permanent, easily identified reference point for water level measurements. The establishment of the location and elevation of the reference point should be made by a professional surveyor as defined in the Survey Specifications of the NAVFAC NW SOP V5.0 (or more current).
An electronic water level meter or tape and paste apparatus accurate to 0.01 foot should be used to measure the water level surface and depth of the well. The presence of light, non-aqueous phase liquids (LNAPLs) and/or dense, non-aqueous phase liquids (DNAPLs) in a well requires measurement of the elevation of the top and the bottom of the product, generally using an electronic interface probe. Water levels in such wells must then be corrected for density effects to accurately determine the elevation of the water table.

2.3.2 Decontamination of Equipment

Each piece of non-dedicated equipment should be decontaminated prior to entering the well. Decontamination should also be conducted prior to the start of sampling at a site, even if the equipment has been known to be decontaminated subsequent to its last usage. This precaution is taken to minimize the potential for cross-contamination. Additionally, each piece of equipment used at the site should be decontaminated prior to leaving the site. Dedicated sampling equipment need only be decontaminated prior to installation within the well. Clean sampling equipment should not be placed directly on the ground or other contaminated surfaces prior to insertion into the well. Dedicated sampling equipment that has been certified by the manufacturer as being decontaminated can be placed in the well without onsite decontamination. Further details are presented in SOP III-I, *Equipment Decontamination*.

2.3.3 Detection of Immiscible Phase Layers

Unless specified in the project plans, groundwater samples should not be collected from wells with detectable amounts of LNAPL and DNAPL.

2.3.4 Purging Equipment and Use

To help minimize the potential for cross-contamination, well sampling should proceed from the least contaminated well to the most contaminated well. This order may be changed in the field if conditions warrant, particularly if dedicated sampling equipment is used. The water present in a well prior to sampling may not be representative of *in situ* groundwater quality and should be removed prior to sampling. All groundwater removed from potentially contaminated wells should be handled in accordance with the investigation-derived waste (IDW) handling procedures described in SOP I-A-7, *IDW Management*. In order to obtain representative groundwater samples, three well casing volumes should be removed. Table I-C-3-1 presents the casings volumes per linear foot of water.

Table I-C-3-1
Casing Volumes

Casing Diameter (inches)	Volume (gallon/linear foot)
2	0.16
4	0.65
6	1.47

Purging should be accomplished by removing groundwater using bailing or pumping methods. Disposable bailers or tubing should be used when possible. If decontamination of a bailer or tubing is required by the project, Teflon® bailers or tubing is recommended. The goal of purging is to ensure that fresh water from the formation is present in the well casing at time of sampling. During purging, the pump intake should be placed in the middle of the calculated saturated screened interval. During the well purging procedure, water levels measurements should be collected to assess the hydraulic effects of purging.

Water quality parameters should be collected and recorded on a regular basis during purging. Field parameters to be collected may include temperature, pH, specific conductance, salinity, dissolved oxygen, Redox potential, and turbidity. Field personnel should refer to the project plan for specific parameters of measurement requirements. At least seven readings should be taken during the purging process. These parameters are measured to demonstrate that the natural character of the formation waters has been restored. Purging should be considered complete when three consecutive field parameter measurements stabilize within 10%. Turbidity may be considered stable if values are less than 10 nephelometric turbidity units (NTUs). The criterion for temperature may not be applicable if a submersible pump is used during purging due to the heating of the water by the pump motor. All information obtained during the purging and sampling process should be entered into the field logbook. The data may be logged on a groundwater sampling log (Figure I-C-3-1 or equivalent) in addition to the field logbook.

In special situations where LNAPL has been detected in the monitoring well and a groundwater sample is determined to be necessary by the project manager, a stilling tube should be inserted into the well prior to well purging. The stilling tube should be composed of a material that meets the performance guidelines for sampling devices. The stilling tube should be inserted into the well to a depth that allows groundwater from the screened interval to be purged and sampled, but that is below the upper portion of the screened interval where the LNAPL is entering the well screen.

The goal is to sample the aqueous phase (groundwater) while preventing the LNAPL from entering the sampling device. To achieve this goal, the stilling tube must be inserted into the well in a manner that prevents the LNAPL from entering the stilling tube. One method of doing this is to cover the end of the stilling tube with a membrane or material that will be ruptured by the weight of the pump. A piece of aluminum foil can be placed over the end of the stilling tube. The stilling tube is lowered slowly into the well to the appropriate depth and then attached firmly to the top of the well casing. When the pump is inserted, the weight of the pump breaks the foil covering the end of the tube, and the well can be purged and sampled from below the LNAPL layer. The membrane or material that is used to cover the end of the stilling tube must be fastened firmly so that it remains attached to the stilling tube when ruptured. Moreover, the membrane or material must retain its integrity after it is ruptured. Pieces of the membrane or material must not fall off of the stilling tube into the well. Although aluminum foil is mentioned in this discussion as an example of a material that can be used to cover the end of the tube, a more chemically inert material may be required, based on the site-specific situation. Stilling tubes should be thoroughly decontaminated prior to each use. Groundwater removed during purging should be collected and stored onsite until its disposition is determined based upon laboratory analytical results. Storage should be in secured containers such as DOT-approved drums. Containers of purge water should be labeled with NAVFAC NW approved labels or paint pens.

2.3.5 Monitor Well Sampling Methodologies

2.3.5.1 Sampling Light, Non-Aqueous Phase Liquids (LNAPL)

LNAPL, if present, must be collected prior to any purging activities. The sampling device should generally consist of a dedicated or disposable bailer equipped with a bottom-discharging device. The bailer should be lowered slowly until contact is made with the surface of the LNAPL, and lowered to a depth less than that of the immiscible fluid/water interface depth as determined by measurement with the interface probe. The bailer should then be allowed to fill with the LNAPL and retrieved.

When sampling LNAPLs, bailers should never be dropped into a well and should be removed from the well in a manner that causes as little agitation of the sample as possible. For example, the bailer should not be removed in a jerky fashion or be allowed to continually bang against the well casing as it is raised. When using bailers to collect LNAPL samples for inorganic analyses, the bailer should be composed of fluorocarbon resin. Bailers used to collect LNAPL samples for organic analyses should be constructed of stainless steel. The cable used to raise and lower the bailer should be composed of an inert material (e.g., stainless steel) or coated with an inert material (e.g., PTFE).

2.3.5.2 Sampling Dense, Non-Aqueous Phase Liquids (DNAPL)

DNAPL should be collected prior to any purging activities. The best method for collecting DNAPL is to use a double check valve, stainless steel bailer, or a Kemmerer (discrete interval) sampler. The sample should be collected by slow, controlled lowering of the bailer to the bottom of the well, activation of the closing device, and retrieval.

2.3.5.3 Groundwater Sampling Methodology

The well should be sampled when groundwater within it is representative of aquifer conditions and after it has recovered sufficiently to provide enough volume for the selected analyses. A period of no more than 2 hours should elapse between purging and sampling to prevent groundwater interaction with the casing and atmosphere. This may not be possible with a slowly recharging well. Water level should be measured and recorded prior to sampling to demonstrate the degree of recovery of the well. Sampling equipment should never be dropped into the well, because this could cause aeration of the water upon impact. Additionally, the sampling methodology utilized should allow for the collection of a groundwater sample in as undisturbed a condition as possible, minimizing the potential for volatilization or aeration. This includes minimizing agitation and aeration during transfer to sample containers.

2.3.6 Sample Handling and Preservation

Many of the chemical constituents and physiochemical parameters to be measured or evaluated during groundwater monitoring programs, are chemically unstable, and therefore samples must be preserved. The U.S. Environmental Protection Agency document entitled *Test Methods for Evaluating Solid Waste – Physical/Chemical Methods (SW-846),* includes a discussion of appropriate sample preservation procedures. In addition, SW-846 specifies the sample containers that should be used for each constituent or common set of parameters. In general, check with specific laboratory requirements prior to obtaining field samples. In many cases, the laboratory will supply the necessary sample bottles and required preservatives. In some cases, the field team may add preservatives in the field.

Improper sample handling may alter the analytical results of the sample. Samples should be transferred in the field from the sampling equipment directly into the container that has been prepared specifically for that analysis or set of compatible parameters as described in the Quality Assurance Project Plan.

When sampling for VOCs, water samples should be collected in vials or containers specifically designed to prevent loss of VOCs from the sample. Analytical Laboratories shall provide vials, preferably by the laboratory that will perform the analysis. Groundwater from the sampling device should be collected in vials by allowing the groundwater to slowly flow along the sides of the vial. Sampling equipment should not touch the interior of the vial. The vial should be filled above the top of the vial to form a positive meniscus with no overflow. No headspace should be present in the sample container once the container has been capped. To check for headspace, invert the vial, and then tap the side of the vial to dislodge any air bubbles. Sometimes, it is not possible to collect a sample without air bubbles, particularly water that is aerated. In these cases, the investigator should note the problem to account for possible error. Field logs and laboratory analysis reports should note any headspace in the sample container(s) at the time of receipt by the laboratory, as well as at the time the sample was first transferred to the sample container at the wellhead.

2.3.6.1 Special Handling Considerations

Samples requiring analysis for organics should not be filtered. Samples should not be transferred from one container to another because this could cause aeration or a loss of organic material onto the walls of the container.

Groundwater samples to be analyzed for metals should be obtained sequentially. One sample should be obtained directly from the pump and be unfiltered. The second sample should be filtered through a 0.45-micron membrane in-line filter, transferred to a container, preserved with nitric acid to a pH less than 2, and analyzed for dissolved metals. Allow at least 500 ml of effluent to flow through the filter prior to sampling. Any difference in concentration between the total and dissolved fractions may be attributed to the original metallic ion content of the particles and adsorption of ions onto the particles.

2.3.6.2 Field Sampling Preservation

Samples should be preserved immediately upon collection. Ideally, sample jars contain preservatives of known concentration and volume during the initial filling of the jar to a predetermined final sample volume. For example, metals require storage in aqueous media at pH of 2 or less. Typically, 0.5 ml of 1:1 nitric acid added to 500 ml of groundwater will produce a pH less than 2.0. Certain matrices that have alkaline pH (greater than 7) may require more preservative than is typically required. An early assessment of preservation techniques, such as the use of pH strips after initial preservation, may therefore be appropriate. It should be noted that introduction of preservatives will dilute samples, and may require normalization of results. Guidance for the preservation of environmental samples can be found in the EPA "Handbook for

Sampling and Sample Preservation of Water and Wastewater:" (EPA 1982). Additional guidance can be found in other EPA documents (EPA 1992, EPA 1995.)

2.3.6.3 Field Sampling Log

A groundwater sampling log should be documented in the field logbook and contain the following information:

- Identification of well
- Well depth
- Static water level depth
- Presence of immiscible layers
- Purge volume and pumping rate
- Time that the well was purged
- Sample ID
- Well evacuation procedure/equipment
- Date and time of collection
- Parameters requested for analysis
- Field analysis data, including purge parameter measurements
- Field observations during sampling event
- Name of collector

3.0 DOCUMENTATION

Information collected during groundwater sampling should be documented in the field logbook in accordance with SOP III-D, *Logbooks* in indelible ink. In addition, groundwater sample purge logs (Figure I-C-3-1 or equivalent) may be completed. Copies of this information should be sent to the Project Manager and to the project files.

4.0 REFERENCES

EPA. 1982. Handbook for Sampling and Sample Preservation of Water and Wastewater. EPA-600/4-82-029. September 1982.

NJDEP. 1986. Field Sampling Procedures Manual. New Jersey Department of Environmental Protection.

SOP I-A-7, *IDW Management*

SOP I-C-5, *Low-Flow Groundwater Purging and Sampling*

SOP III-I, *Equipment Decontamination*

SOP III-B, *Field QC Samples*

SOP III-D, *Field Logbooks*

USEPA. 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document.

USEPA. 1992. RCRA Ground-Water Monitoring: Draft Technical Enforcement Guidance Document.

USEPA. 1995 and as revised. Test Methods for Evaluating Solid Waste–Physical/Chemical Methods (SW-846). January 1995.

USEPA. 1994a and as revised. Contract Laboratory Program (CLP) Statement of Work (SOW) for Organic Analysis.

USEPA. 1994b and as revised. Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganics Analysis.

U.S. EPA Environmental Response Team. 1988. Response Engineering and Analytical Contract Standard Operating Procedures. U.S. EPA, Research Triangle Park, NC.

5.0 ATTACHMENTS

None.

Figure 1-C-3-1
Groundwater Sampling Log

Project Number: ____________________ Date: ____________________

Location: ____________________ Time: ____________________

Well Number: ____________________ Climatic Conditions: ____________________

Initial Measurements: Static Water Level: ____________________
Total Depth: ____________________

Well Purging: Length of Saturated Zone: ____________________linear feet
Volume of Water to be Evacuated: ____________________gals./linear ft. x
Linear feet of Saturation x Casing Volumes* = ____________________gallons
Method of Removal: ____________________
Pumping Rate: ____________________ gallons/minute

Well Purge Data:

DATE/ TIME	GALLONS REMOVED	pH	SP. COND.	D.O.	REDOX	TURBIDITY

Sample Withdrawal Method: ____________________

Appearance of Sample:
Color ____________________
Turbidity ____________________
Sediment ____________________
Other ____________________

Laboratory Analysis Parameters and Preservatives: ____________________

Number and Types of Sample Containers Used: ____________________

Sample Identification Number(s): ____________________

Decontamination Procedures:____________________

Notes: ____________________

Sampled by:____________________
Samples delivered to:____________________
Date/Time:____________________
Transporters: ____________________

* Capacity of casing (gallons/linear foot): 2”-0.16, 4”-0.65, 6”-1.47, 8”-2.61, 10”-4.08, 12”-5.87

LOW-FLOW GROUNDWATER PURGING AND SAMPLING

1.0 PURPOSE

This standard operating procedure (SOP) describes the conventional monitoring well sampling procedures to be used by all U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) personnel and contractors. Conventional monitoring well sampling procedures are provided in SOP I-C-4, *Groundwater Sampling from Temporary Wells (Piezometers)*.

2.0 PROCEDURE

2.1 PURPOSE

This procedure establishes the method for sampling groundwater monitoring wells for water-borne contaminants and general groundwater chemistry. The objective is to obtain groundwater samples with as little alteration of water chemistry as possible.

2.2 PREPARATION

2.2.1 Site Background Information

A thorough understanding of the purposes of the sampling event should be established prior to commencing field activities. A review of available data obtained from the site and pertinent to the water sampling should also be conducted. Copies of well logs or summary tables regarding well construction information should be available on-site if possible.

Previous groundwater development and sampling logs give a good indication of well purging rates and the types of problems that may be encountered during sampling, such as excessive turbidity and low well yield. They may also indicate where dedicated pumps are placed in the water column.

It is highly recommended that the field sampling team is familiar with the U.S. EPA recommended protocols for low-flow sampling outlined in the April 1996 Ground Water Issue *Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures* (U.S. EPA 1996).

2.2.2 Groundwater Analysis Selection

The requisite field and laboratory analyses should be established prior to performing water sampling. The types and numbers of quality assurance/quality control (QA/QC) samples to be collected (refer to SOP III-B, *Field QC Samples (Water, Soil)*) should be specified in the QA plan developed for the site.

2.3 GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling procedures at a site should include: (1) measurement of depth to groundwater and total depth, (2) assessment of the presence or absence of an immiscible phase (if required by the project plan), (3) assessment of purge parameter stabilization, (4) purging of static water within the well and well bore, and (5) obtaining a groundwater sample. Each step is discussed in sequence below. Depending upon specific field conditions, additional steps may be necessary. As a rule, at least 24 hours should separate well development and well sampling events.

2.3.1 Measurement of Static Water Level Elevation

The depth to water and the total depth of the well should be measured to the nearest 0.01 foot to provide baseline hydrologic data, to calculate the volume of water in the well, and to provide information on the integrity of the well (e.g., identification of siltation problems). Dependent upon individual project requirements, synoptic water level collection may be required prior to groundwater sampling activities. In the event that synoptic water levels **are not** collected prior to sampling activities, total depth measurements should be collected **after** purging and sampling activities to prevent the suspension of fine-grained sediment that may be present at the bottom of the well. Each well should be marked with a permanent, easily identified reference point for water level measurements whose location and elevation have been surveyed.

An electronic water level meter accurate to 0.01 foot should be used to measure the water level surface and depth of the well. The presence of light, non-aqueous phase liquids (LNAPLs) and/or dense, non-aqueous phase liquids (DNAPLs) in a well requires measurement of the elevation of the top and the bottom of the product, generally using an interface probe. Water levels in such wells must then be corrected for density effects to accurately determine the elevation of the water table.

2.3.2 Decontamination of Equipment

Each piece of non-dedicated equipment should be decontaminated prior to entering the well. Decontamination should also be conducted prior to the start of sampling at a site, even if the equipment is known to be decontaminated subsequent to its last usage. This precaution is taken to minimize the potential for cross-contamination. In addition, each piece of equipment used at the site should be decontaminated prior to leaving the site. Dedicated sampling equipment need only be decontaminated prior to installation within the well. Clean sampling equipment should not be placed directly on the ground or other contaminated surfaces prior to insertion into the well. Dedicated sampling equipment that has been certified by the manufacturer as being decontaminated can be placed in the well without onsite decontamination.

Further details are presented in SOP III-I, *Equipment Decontamination*.

2.3.3 Detection of Immiscible Phase Layers

Unless specified in the project plans, groundwater samples should not be collected from wells with detectable amounts of LNAPL and DNAPL.

2.3.4 Purging Equipment and Use

To help minimize the potential for cross-contamination, well sampling should proceed from the least contaminated to the most contaminated. This order may be changed in the field if conditions warrant, particularly if dedicated sampling equipment is used. If decontamination of tubing is required by the project, Teflon® tubing is recommended. All groundwater removed from potentially contaminated wells should be handled in accordance with the investigation-derived waste (IDW) handling procedures described in SOP I-A-7, *IDW Management*.

Purging should be accomplished by removing groundwater from the well at low flow rates using a pump. According to the U.S. EPA (1996), the rate at which groundwater is removed from the well during purging ideally should be between than 0.1 to 0.5 L/min. The pump intake should be placed in the middle of the calculated saturated screened interval. The purge rate should be low enough that substantial drawdown (>0.3 foot) in the well does not occur during purging. If a stabilized drawdown in the well can’t be achieved and the water level is approaching the top of the screened interval, reduce the flow rate or turn the pump off (for 15 minutes) and allow for recovery. It should be noted whether or not the pump has a check valve. A check valve is required if the pump is shut off. ***Under no circumstances should the well be pumped dry or otherwise over-purged***. Begin pumping at a lower flow rate, if the water draws down to the top of the screened interval again turn pump off and allow for recovery. If two tubing volumes (including the volume of water in the pump and flow cell) have been removed during purging then sampling can proceed next time the pump is turned on. This information should be noted in the field notebook or groundwater sampling log with a recommendation for a different purging and sampling procedure (USEPA, 2012).

Water level measurements should be collected to assess the water level effects of purging. A low purge rate also will reduce the possibility of stripping VOCs from the water, and will reduce the likelihood of mobilizing colloids in the subsurface that are immobile under natural flow conditions.

Water quality parameters should be collected and recorded on a regular basis (every 3-5 minutes) during well evacuation. Field parameters to be collected may include temperature, pH, specific conductance, salinity, dissolved oxygen, Redox potential, and turbidity. At least seven readings should be taken during the purging process unless the field parameters stabilize more quickly. These parameters are measured to demonstrate that the formation water, not stale well casing water, is being evacuated. Purging should be considered complete when the high and low values between three consecutive field parameter measurements stabilize within 10%. Turbidity may be considered stable if values are less than 10 nephelometric turbidity units (NTUs). The criterion for temperature may not be applicable if a submersible pump is used during purging due to the heating of the water by the pump motor. Field personnel should refer to the project-specific Sampling and Analysis Plan (SAP) for specific measurement requirements and well stabilization criteria.

All information obtained during the purging and sampling process should be entered into the field logbook. In addition to the field logbook, the data may be logged on a groundwater sampling log (Figure I-C-5-1 or equivalent). In special situations where LNAPL has been detected in the monitoring well and a groundwater sample is determined to be necessary by the Project Manager, a stilling tube should be inserted into the well prior to well purging. The stilling tube should be composed of a material that meets the performance guidelines for sampling devices. The stilling tube should be inserted into the well to a depth that allows groundwater from the screened interval to be purged and sampled. The bottom of the tube should be set below the upper portion of the screened interval where the LNAPL is entering the well screen. The goal is to sample the aqueous phase (groundwater) while preventing the LNAPL from entering the sampling device. To achieve this goal, the stilling tube must be inserted into the well in a manner that prevents the LNAPL from entering the stilling tube.

One method of doing this is to cover the end of the stilling tube with a membrane or material that will be ruptured by the weight of the pump. A piece of aluminum foil can be placed over the end of the stilling tube. The stilling tube is lowered slowly into the well to the appropriate depth and then attached firmly to the top of the well casing. When the pump is inserted, the weight of the pump breaks the foil covering the end of the tube, and the well can be purged and sampled from below the LNAPL layer. The membrane or material that is used to cover the end of the stilling tube must be fastened firmly so that it remains attached to the stilling tube when ruptured. Moreover, the membrane or material must retain its integrity after it is ruptured. Pieces of the membrane or material must not fall off of the stilling tube into the well. Although aluminum foil is mentioned in this discussion as an example of a material that can be used to cover the end of the tube, a more chemically inert material may be required, based on the site-specific situation. Stilling tubes should be thoroughly decontaminated prior to each use. Groundwater removed during purging should be collected and stored onsite until its disposition is determined based upon laboratory analytical results. Storage should be in secured containers such as DOT-approved drums. Containers of purge water should be labeled with NAVFAC NW approved labels or paint pens.

2.3.5 Groundwater Sampling Methodology

The well should be sampled when groundwater within it is representative of aquifer conditions and after it has recovered sufficiently to provide enough volume for the groundwater sampling parameters. A period of no more than 2 hours should elapse between purging and sampling to prevent groundwater interaction with the casing and atmosphere. This may not be possible with a slowly recharging well. The water level should be measured and recorded prior to sampling to demonstrate the degree of recovery of the well. Sampling equipment should never be dropped into the well, because this could cause aeration of the water upon impact. In addition, the sampling methodology utilized should allow for the collection of a groundwater sample in as undisturbed a condition as possible, minimizing the potential for volatilization or aeration. This includes minimizing agitation and aeration during transfer to sample containers.

2.3.6 Sample Handling and Preservation

Many of the chemical constituents and physiochemical parameters to be measured or evaluated during groundwater monitoring programs are chemically unstable; therefore, samples must be preserved. The U.S. Environmental Protection Agency document entitled *Test Methods for Evaluating Solid Waste – Physical/Chemical Methods (SW-846)* (U.S. EPA 1995), includes a discussion of appropriate sample preservation procedures. In addition, SW-846 specifies the sample containers that should be used for each constituent or common set of parameters. In general, check with specific laboratory requirements prior to obtaining field samples. In many cases, the laboratory will supply the necessary sample bottles and required preservatives. In some cases, the field team may add preservatives in the field.

Improper sample handling may alter the analytical results of the sample. Samples should be transferred in the field from the sampling equipment directly into the container that has been prepared specifically for that analysis or set of compatible parameters as described in the Quality Assurance Project Plan.

When sampling for VOCs, water samples should be collected in vials or containers specifically designed to prevent loss of VOCs from the sample. An analytical laboratory should provide these vials, preferably by the laboratory that will perform the analysis. Groundwater from the sampling device should be collected in vials by allowing the groundwater to slowly flow along the sides of the vial. Sampling equipment should not touch the interior of the vial. The vial should be filled above the top of the vial to form a positive meniscus with no overflow. No headspace should be present in the sample container once the container has been capped. The sample can be checked for headspace by inverting the sample bottle and tapping the side of the vial to dislodge air bubbles. Sometimes it is not possible to collect a sample without air bubbles, particularly water that is aerated or naturally carbonated. In these cases, the investigator should note the problem to account for possible error. Field logs and laboratory analysis reports should note any headspace in the sample container(s) at the time of receipt by the laboratory, as well as at the time the sample was first transferred to the sample container at the wellhead.

2.3.6.1 Special Handling Considerations

Samples requiring analysis for organics should not be filtered. Samples should not be transferred from one container to another because this could cause aeration or a loss of organic material onto the walls of the container.

Groundwater samples to be analyzed for total and dissolved metals should be obtained sequentially. The sample to be analyzed for total metals, should be obtained directly from the pump and be unfiltered. The second sample should be filtered through a 0.45-micron membrane in-line filter and transferred to a container to be analyzed for dissolved metals. Allow at least 500 ml of effluent to flow through the filter prior to sampling. Any difference in concentration between the total and dissolved fractions may be attributed to the original metallic ion content of the particles and adsorption of ions onto the particles.

2.3.6.2 Field Sampling Preservation

Samples should be preserved immediately upon collection. Ideally, sample jars contain preservatives of known concentration and volume during the initial filling of the jar to a predetermined final sample volume. For example, metals require storage in aqueous media at pH of 2 or less. Typically, 0.5 ml of 1:1 nitric acid added to 500 ml of groundwater will produce a pH less than 2.0. Certain matrices that have alkaline pH (greater than 7) may require more preservative than is typically required. An early assessment of preservation techniques, such as the use of pH strips after initial preservation, may therefore be appropriate. It should be noted that introduction of preservatives will dilute samples, and may require normalization of results. Guidance for the preservation of environmental samples can be found in the EPA "Handbook for Sampling and Sample Preservation of Water and Wastewater:" (U.S. EPA 1982).

3.0 DOCUMENTATION

Information collected during groundwater sampling should be documented in the field logbook in accordance with SOP III-D, *Logbooks*. In addition, groundwater sampling purge logs may be (Figure I-C-5-1 or equivalent) may be filled out in addition to the field logbook. Copies of this information should be sent to the Project Manager and to the project files.

A groundwater sampling log should be documented in the field logbook and contain the following information:

- Identification of well
- Well depth
- Static water level depth
- Presence of immiscible layers
- Purge volume and pumping rate
- Time that the well was purged
- Collection method for immiscible layers
- Sample IDs
- Well evacuation procedure/equipment
- Date and time of collection
- Parameters requested for analysis
- Field analysis data
- Field observations on sampling event
- Name of collector

Figure 1-C-5-1
Groundwater Sampling Log

Project Number: ________________________ Date: ________________________

Location: ________________________ Time: ________________________

Well Number: ________________________ Climatic Conditions: ________________________

Initial Measurements: Static Water Level: ________________
Total Depth: ________________

Well Purging: Length of Saturated Zone: ________________linear feet
Volume of Water to be Evacuated: ________________gals./linear ft. x
Linear feet of Saturation x Casing Volumes* = ________________gallons
Method of Removal: ________________________
Pumping Rate: ________________ gallons/minute

Well Purge Data:

DATE/ TIME	GALLONS REMOVED	pH	SP. COND.	D.O.	REDOX	TURBIDITY

Sample Withdrawal Method: ________________________
Appearance of Sample: Color ________________________
Turbidity ________________________
Sediment ________________________
Other ________________________

Laboratory Analysis Parameters and Preservatives: ________________________
____

Number and Types of Sample Containers Used: ________________________
____

Sample ID(s): ________________________
____

Decontamination Procedures:________________________
____

Notes: ________________________
____

Sampled by:________________________
Samples delivered to:________________________
Date/Time:________________________
Transporters: ________________________

* Capacity of casing (gallons/linear foot): 2”-0.16, 4”-0.65, 6”-1.47, 8”-2.61, 10”-4.08, 12”-5.87

4.0 REFERENCES

SOP I-A-7, IDW Management
SOP *-C-4, *Groundwater Sampling from Temporary Wells (Piezometers)*
SOP III-I, Equipment Decontamination
SOP III-B, Field QC Samples
SOP III-D, Logbooks
U.S. EPA. 1982. Handbook for Sampling and Sample Preservation of Water and Wastewater. EPA-600/4-82-029. September 1982.
U.S. EPA. 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document.
U.S. EPA. 1996. Ground Water Issue, Low-flow (Minimal Drawdown) Groundwater Sampling Procedures. EPA/540/S-95/504. April 1996
U.S. EPA. 1995 and as revised. Test Methods for Evaluating Solid Waste–Physical/Chemical Methods (SW-846). January 1995.
U.S. EPA. 2012. Standard Operating Procedure Low-Stress (Low Flow) / Minimal Drawdown Ground-Water Sample Collection, USEPA, Region 9, Management and Technical Services Division, April 2012.

5.0 ATTACHMENTS

None.

WATER LEVEL MEASUREMENTS

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish standard protocols for all U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) field personnel for use in making water level measurements.

2.0 PROCEDURE

2.1 EQUIPMENT

Equipment and materials used during liquid level and well-depth measurements:

- Electronic water level indicator with cable marked with 0.01-foot increments
- Electronic oil-water interface probe
- Engineers measuring tape with 0.01-foot increments may be used for water and petroleum reactive pastes as an alternative to an oil-water interface probe
- Weighted steel tape with 0.01-foot increments and chalk may be used as an alternative to a water level indicator
- Decontamination equipment
- Weatherproof, bound field logbook with numbered pages (see SOP III-D, *Logbooks*)
- Health and safety equipment appropriate for site conditions
- Keys for locked well covers
- Wire cutters if well has a security tag
- Turkey baster or hand pump in case flush-mount manhole is filled with water
- Bolt cutters for cutting “frozen” or rusted locks. HWD-40 is used to lubricate a rusted lock, but extreme care should be taken to avoid possible contamination to the well and equipment.
- Extra locks to replace cut locks

2.2 PRELIMINARY STEPS

Follow these steps prior to disturbing the liquid level in the well:

1. Locate the well and, confirm its label (if marked), and verify its position relative to other site features on the site map. Gain access to the top of the well casing.
2. Locate the permanent reference mark at the top of the well casing. This reference point shall be scribed, notched, or otherwise noted on the top of the casing. If no such marks are present, measure depth relative to the top of the highest point of the well casing and note this fact in the field logbook. Determine from the records and record the elevation of the permanent reference point and record it in the logbook.
3. Record any observations and remarks regarding the characteristics and condition of the well, such as evidence of cracked casing or surface seals, security of the well (locked cap), evidence of tampering, missing well cap, surface water entering the well casing, etc.
4. Open the well monument and remove the well cap when first arriving on site to allow potentially pressurized well casing air to equilibrate with atmospheric pressure.

2.3 OPERATION

Follow these steps when taking depth to liquid level measurements in well suspected to have NAPL present.

1. Sample the air in the wellhead for gross organic vapors if required.
2. If non-aqueous phase liquid (NAPL) contamination is suspected, use an oil-water interface probe to determine the existence and thickness of the NAPL.
3. Open interface probe housing, turn probe on, and test the alarm. Ground the probe, because the slight electric charge from the probe could set off an explosion of highly flammable vapors. Slowly lower the probe into the well until the alarm sounds. A continuous alarm indicates light non-aqueous phase liquid (LNAPL), while an intermittent alarm indicates water. If LNAPL is detected, record depth of the initial (first) alarm. Mark the spot by grasping the cable with the thumb and forefingers at the top of the casing. Determine the depth to liquid relative to the permanent reference point on the well casing. Withdraw cable sufficiently to record the depth from the scale on the interface probe cable.
4. Continue to slowly lower the probe until it passes into the water phase (intermittent alarm). Slowly retract the probe until the NAPL continuous alarm sounds and record that level in the same manner as described above.
5. Record the depth to NAPL and the depth to water readings independently in the logbook. The thickness of the LNAPL can be calculated by subtracting depth to LNAPL reading from depth to water measurement.
6. Continue to slowly lower the interface probe through the water column to check for the presence of dense non-aqueous phase liquid (DNAPL) if suspected.
7. Measure and record the depths of the DNAPL layer (if any) as described above.
8. Slowly raise the interface probe, recording the depth to each interface as the probe is withdrawn. If there is a discrepancy in depths, clean the probe sensor and recheck the depth measurements.
9. Always lower and raise the interface probe slowly to minimize mixing of media.
10. Always perform a NAPL check in wells installed in areas with suspected NAPL contamination. Always perform a NAPL check if headspace test reveals presence of volatiles. Always perform a NAPL check the first time depth to liquid is measured in a well. If a well has been measured previously, with no NAPLs present, and none of the preceding conditions are met, the NAPL check may be omitted.
11. Decontaminate interface probe as appropriate.

For wells where NAPL is not suspected to be present, an electronic water level indicator or steel tape can be used as described below:

1. Remove the water level indicator probe from the case, turn on the sounder, and test the battery and sensitivity scale by pushing the test button. Adjust the sensitivity scale until you can hear the alarm.
2. Slowly lower the probe and cable into the well, allowing the cable reel to unwind. Continue lowering the probe until the alarm sounds. Very slowly raise and lower the probe until the point is reached where the meter just beeps. Mark the spot by grasping the cable with thumb and forefingers at the top of the casing. Record the depth to water relative to the permanent reference point. If no mark is present, use the highest point on the casing as a reference point. Withdraw the cable and record the depth.

3. Alternately, use a steel tape with an attached weight if the aquifer gradients are lower than 0.05 ft./ft. Due to the possibility of adding unknown contaminants from chalk colorants, only white chalk is permitted as a level indicator.
4. Rub chalk onto the end (first 1 foot) of the steel tape and slowly lower the chalked end into the well until the weighted end is below the water surface. (A small splash can be heard when the weighted end hits the water surface.)
5. Mark the spot on the tape by grasping the tape with the thumb and forefingers at the top of the casing as described in the subsection (2) above. Record this spot on the tape in the logbook as the “HOLD”. Ensure not to retract the tape from the well until after the depth measurement (HOLD) is recorded.
6. Remove the steel tape from the well. The chalk will be wet or absent where the tape was below the water surface. Locate, read, and record this length in the logbook as the “CUT”. Subtract the “CUT” length from the ”HOLD” length and record the difference in the logbook. This is the depth to water table.
7. Decontaminate water level indicator or steel tape as appropriate

2.4 PRECAUTIONS

- Depending on the device used, correction factors may be required for some measurements. For example, if the water level indicator has been shortened during its repair.
- Check instrument batteries prior to each use.
- Exercise care not to break the seals at the top of the electric water level indicator probe.
- It is important to note that when measuring total well depth (bottom of casing), using an interface probe or water level indicator, the increments of measure are ticked off from the alarm sensor on the probe. On some meters there is a portion of the probe that sticks out beyond the alarm sensor. This needs to be accounted for when reading the bottom of casing measurement (i.e., added onto the reading). A potential problem arises if it is unknown whether this has been done on previous readings or not.

3.0 DOCUMENTATION

This section describes the documentation necessary for depth to liquid and well-depth measurements. All information shall be recorded in the field logbook using indelible ink in accordance with SOP III-D, *Logbooks*. At a minimum, the following information must be recorded:

- Date
- Time
- Weather
- Field personnel
- Well location and label
- Well condition
- Monitoring equipment type and readings
- Depth to Liquid measurements obtained
- Any other observations

All entries in the field logbook must be printed in black ink and legible. The actual readings measured should be recorded directly in the logbook. If calculations are necessary to determine the depth to liquid or liquid elevation, they should be performed using direct readings documented in the logbook.

Water level measurements must also be submitted electronically using the appropriate Naval Electronic Data Deliverable (NEDD) format for loading into NIRIS as defined in the NAVFAC NW SOPs (V5.0 or more current).

4.0 REFERENCES

SOP III-D, *Logbooks*

Thornhill, Jerry T. 1989. “Accuracy of Depth to Groundwater Measurements.” In *EPA Superfund Groundwater Issue.* EPA/504/4-89/002.

5.0 ATTACHMENTS

None.

FIELD PARAMETER MEASUREMENTS

1.0 PURPOSE

This standard operating procedure (SOP) provides instructions for the calibration, use, and checking of instruments and equipment for field measurements.

2.0 PROCEDURES

2.1 WATER QUALITY MEASUREMENTS

All field water quality meters shall be calibrated daily following the manufacturers' specifications. Calibration shall be performed prior to using the instrument for collecting parameters. In addition, the meter's calibration should be checked at mid-day and the end of the day to determine if measurements have drifted from the original calibration numbers. These checks are not intended to be a recalibration of the instrument. All calibration and measurement data shall be recorded in the project logbook. Fluids used for calibration shall be changed at regular intervals to ensure its integrity. Since different fluids have different shelf lives and tolerances, manufacturers' specifications should be checked as appropriate.

Most multi-probe water quality meters utilize a flow-through cell. If the unit being used does not have a flow-through cell, a large enough vessel (i.e. polypropylene beaker) in which the probes will be submerged shall be used. The water to be measured will be pumped continuously through the beaker from the bottom, overflowing the top. The flow-through cells will usually allow for quicker stabilization of dissolved oxygen and oxidation-reduction potential readings. Water shall be allowed to flow continuously through the cell or beaker with water quality measurements being collected at regular intervals, every three to five minutes, until stabilization of the parameters has occurred. A minimum number of seven sets of readings should be collected or as otherwise outlined in the field sampling plan. Stabilization is considered to have occurred when three consecutive readings meet the following guidelines:

pH	+ 0.2 Scientific Units
Specific Conductance	+ 3 % mS/cm
Turbidity	+ 10% or < 10 NTUs
Dissolved Oxygen	+ 10% mg/cm
Salinity	+ 10%
Oxidation-Reduction Potential	+ 10 mV
Temperature	+ 10% °C

In addition to recording the above listed parameters the following information shall also be documented: date, time of measurement, flow rates, purge volumes, total volume purged, and other relative information (i.e. odors, sheen, comments on turbidity, water color)

2.2 ORGANIC VAPORS

Various organic vapor monitors have differing requirements for equipment warm-up and operation. Ensure that all organic vapor monitors are calibrated and operated according to the manufacturer's specification.

For measuring vapors present in soils, expose the monitor to a sample of soil by collecting a sample in sealable plastic baggy and placing the probe tip into the closed bag. In cold weather, the soil may need to be warmed prior to testing.

For measuring breathing zone vapors, hold the probe tip in the area of the breathing zone while field activities are being conducted. Take representative measurements from each different work or sampling area.

For monitoring well head space, place the probe tip just inside of the monitoring well casing immediately after removing the cap.

All readings including calibration information shall be recorded in the field logbook.

3.0 DOCUMENTATION

Record all observations and analysis in the field logbook as defined in SOP III-D, *Logbooks*. If required by the SAP, also complete the Field Measurement Data Form.

Field measurements must also be submitted electronically using the appropriate Naval Electronic Data Deliverable (NEDD) format for loading into NIRIS as defined in the NAVFAC NW SOPs (V5.0 or more current).

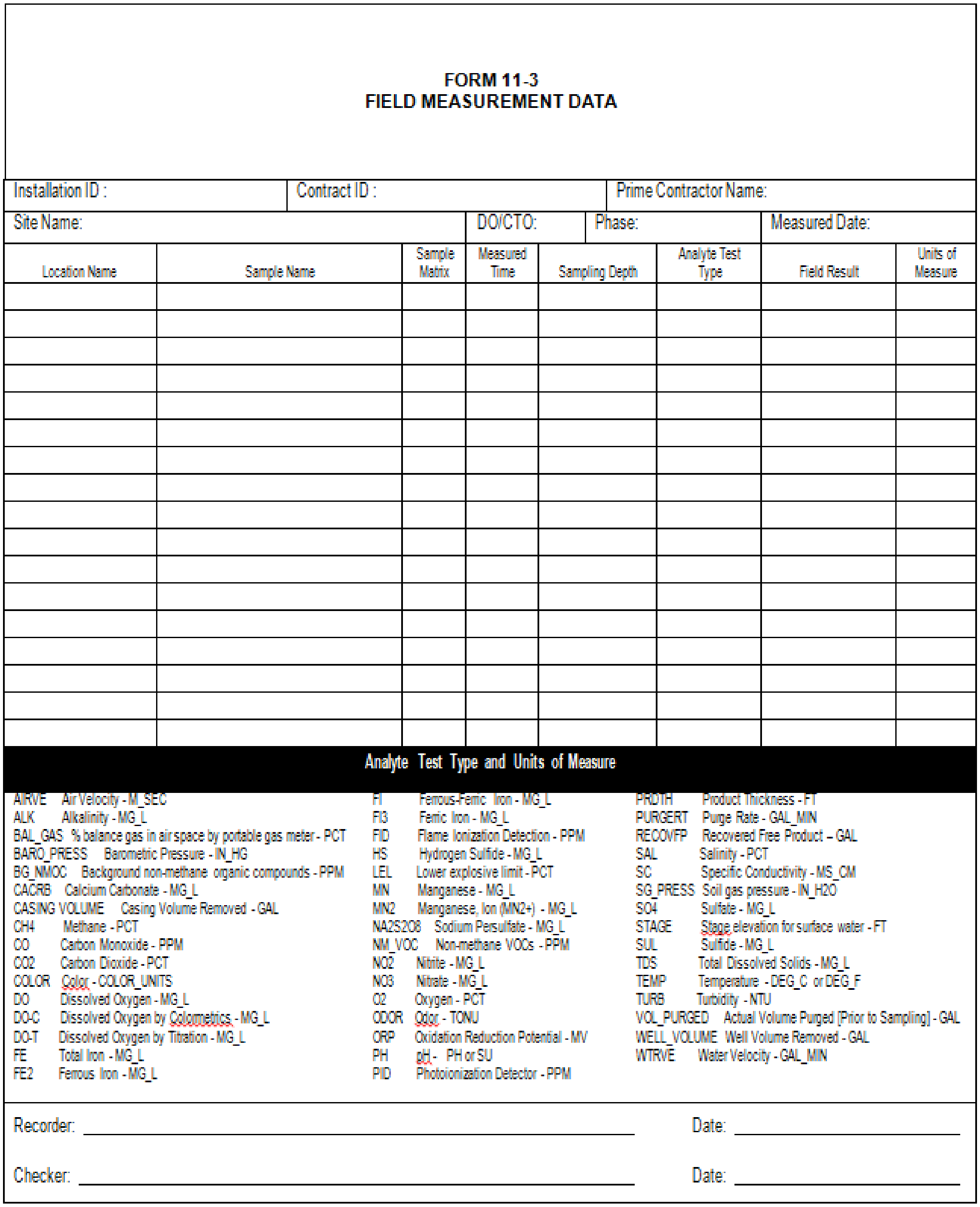
4.0 REFERENCES

ASTM International. 2003. D6771-02 Standard Practice for Low-flow Purging and Sampling Wells and Devices Used for Groundwater Quality Investigations

SOP III-D, *Logbooks*

5.0 ATTACHMENTS

Attachment I-D-7-1 Example Field Measurement Data form



FORM 11-3
FIELD MEASUREMENT DATA

Installation ID :	Contract ID :	Prime Contractor Name:

Site Name:	DO/CTO:	Phase:	Measured Date:

Location Name	Sample Name	Sample Matrix	Measured Time	Sampling Depth	Analyte Test Type	Field Result	Units of Measure

Analyte Test Type and Units of Measure

AIRVE Air Velocity - M_SEC
ALK Alkalinity - MG_L
BAL_GAS % balance gas in air space by portable gas meter - PCT
BARO_PRESS Barometric Pressure - IN_HG
BG_NMOC Background non-methane organic compounds - PPM
CACRB Calcium Carbonate - MG_L
CASING VOLUME Casing Volume Removed - GAL
CH4 Methane - PCT
CO Carbon Monoxide - PPM
CO2 Carbon Dioxide - PCT
COLOR Color - COLOR_UNITS
DO Dissolved Oxygen - MG_L
DO-C Dissolved Oxygen by Colometrics - MG_L
DO-T Dissolved Oxygen by Titration - MG_L
FE Total Iron - MG_L
FE2 Ferrous Iron - MG_L
FI Ferrous-Ferric Iron - MG_L
FI3 Ferric Iron - MG_L
FID Flame Ionization Detection - PPM
HS Hydrogen Sulfide - MG_L
LEL Lower explosive limit - PCT
MN Manganese - MG_L
MN2 Manganese, Ion (MN2+) - MG_L
NA2S2O8 Sodium Persulfate - MG_L
NM_VOC Non-methane VOCs - PPM
NO2 Nitrite - MG_L
NO3 Nitrate - MG_L
O2 Oxygen - PCT
ODOR Odor - TONU
ORP Oxidation Reduction Potential - MV
PH pH - PH or SU
PID Photoionization Detector - PPM
PRDTH Product Thickness - FT
PURGERT Purge Rate - GAL_MIN
RECOVFP Recovered Free Product – GAL
SAL Salinity - PCT
SC Specific Conductivity - MS_CM
SG_PRESS Soil gas pressure - IN_H2O
SO4 Sulfate - MG_L
STAGE Stage elevation for surface water - FT
SUL Sulfide - MG_L
TDS Total Dissolved Solids - MG_L
TEMP Temperature - DEG_C or DEG_F
TURB Turbidity - NTU
VOL_PURGED Actual Volume Purged [Prior to Sampling] - GAL
WELL_VOLUME Well Volume Removed - GAL
WTRVE Water Velocity - GAL_MIN

Recorder: ______________________________ Date: ______________

Checker: ______________________________ Date: ______________

LABORATORY QC SAMPLES (WATER, SOIL)

1.0 PURPOSE

This section sets forth the standard operating procedure (SOP) for identifying the number and type of laboratory Quality Control (QC) samples that will be analyzed during each Task Order associated with the U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) IRP. Laboratory QC analyses serve as a check on the precision and accuracy of analytical methods and instrumentation and potential contamination that may occur during laboratory sample preparation and analyses. Laboratory QC analyses include but are not limited to blank, duplicate, surrogate, blank spike, laboratory control sample, and matrix spike/ matrix spike duplicate analyses. These laboratory QC analyses are discussed in general below.

2.0 PROCEDURES

Laboratory QC checks include all types of samples specified in the requested analytical methods, such as the analysis of laboratory blank, duplicate, and matrix spike samples. Types of QC samples are discussed in general below. The procedures presented below are minimum requirements; QC requirements of each analytical method must also be followed, and take precedence over this SOP.

2.1 LABORATORY BLANKS

Laboratory blank samples are analyzed to assess the degree to which laboratory contamination by reagent or method preparation may have affected sample analytical results. At a minimum, one laboratory blank will be analyzed per matrix per analytical method for each batch of at most 20 samples.

In evaluating the blank results, all blank data are reviewed to identify any compounds detected in the blanks. The laboratory shall be contacted to discuss detection of analytes in blank samples only in the event of unusual contamination, but not for common laboratory contaminants at low levels. The following compounds are considered to be common laboratory contaminants: acetone, methylene chloride, 2-butanone, and common phthalate esters. The data for samples analyzed during the same time period as the blank are then evaluated to identify the presence of any contaminants found in the blanks. The presence of the blank contaminants found in associated samples is then evaluated to avoid potential misinterpretation of actual sample constituents. Briefly, as discussed in the data validation SOPs, any analyte detected in both the sample and the associated blank is qualified as not detected if the sample concentration is less than 5 times the blank concentration (5x rule). For common laboratory contaminants (methylene chloride, acetone, toluene, 2-butanone, and common phthalate esters), a 10x rule applies.

2.2 DUPLICATES

Laboratory duplicates are analyzed to evaluate the reproducibility, or precision, of the analytical procedures for a given sample. Results of duplicate analyses are reported as the RPD, which is calculated by dividing the absolute value of the difference in concentration between the duplicate and original sample analyses by the arithmetic mean of their concentrations and multiplying the result by 100. One duplicate sample is analyzed for each batch of at most 20 samples analyzed of similar matrix. Duplicate analyses are normally performed on sample portions analyzed for inorganic constituents. For organic analyses, duplicate analyses are performed on matrix spike samples (see Section 5.3 of this procedure).

2.3 MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Matrix spike (MS) analyses are conducted by the laboratory to assess the accuracy of specific analytical methods and to provide information on the effect of the sample matrix on the analytical methodology. Spike analyses are performed by adding compounds of known concentration to a sample, an unspiked portion of which has previously been analyzed or is concurrently analyzed; spikes are representative target compounds for each analytical method performed. The spiked sample is reanalyzed and the original and the spiked sample results are compared. One matrix spike is analyzed for each batch of at most 20 samples of similar matrix. Since MS samples only provide information about the specific sample matrix used for the spike, MS analyses should be performed for each type of matrix collected.

For the matrix spike duplicate (MSD), a separate sample is separately spiked and analyzed. As discussed in Section 5.2, results of matrix spike duplicate analyses are reported the RPD, which is calculated by dividing the difference in concentration between the matrix spike duplicate and the matrix spike sample analyses by the arithmetic mean of their concentrations. One matrix spike duplicate analysis is required for at most each 20 samples of similar matrix.

2.4 BLANK SPIKES, SURROGATES, AND LABORATORY CONTROL SAMPLES

Blank spikes, surrogates, and laboratory control samples are used to demonstrate that the laboratory process for sample preparation and analysis is under control.

Analytes selected for spiking of blank spikes and laboratory control samples are usually the same compounds used to spike MS/MSD samples and are representative target compounds.

At least two pesticides should be used as surrogates when pesticide analyses are being performed, and one polychlorinated biphenyl (PCB) when PCBs are analyzed. For wet chemistry methods, a single spike of an appropriate control for each method may be used for laboratory control sample analyses (i.e., cyanide, a control standard of sodium cyanide from a source other than that used for calibration may be spiked into water samples and analyzed with the water samples). For metals, at least three metals typically analyzed by inductively coupled plasma (ICP) must be monitored, and each element analyzed by graphite furnace atomic absorption and cold-vapor atomic absorption needs to be monitored. Blank spikes and laboratory control samples should be analyzed at a frequency of 1 per batch of at most 20 samples analyzed of similar matrix. Surrogates are required to be analyzed with all samples analyzed for volatile organics, base/neutral-acid extractables, and pesticides/PCBs.

3.0 DOCUMENTATION

Records of laboratory QC samples analyzed during IRP Task Order activities will be maintained on laboratory bench sheets, raw data sheets, in the laboratory computerized data system, and on QC summary forms as requested. These QC summary forms will be provided in the laboratory analytical reports and laboratory data packages transmitted for each IRP Task Order.

4.0 REFERENCES

NFESC. 1999. Navy Installation and Restoration Chemical Data Quality Manual.

NFESC. 1996. Navy Installation Restoration Laboratory Quality Assurance Guide. February.
SOP I-A-8, *Data Validation Planning and Coordination*

5.0 ATTACHMENTS

None.

FIELD QC SAMPLES (WATER, SOIL, SEDIMENT, TISSUE)

1.0 PURPOSE

This standard operating procedure (SOP) describes the number and types of field Quality Control (QC) samples that will be collected during U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) site field work. Quality control samples are controlled samples introduced into the analysis stream, whose results are used to review data quality and to calculate the accuracy and precision of the chemical analysis program. The purpose of each type of QC sample collection is described in this procedure. Collection and analysis frequency for quality control samples vary by project and are found in the project QA plan. Note that project-specific or contract requirements may supersede the requirements presented in this SOP.

2.0 PROCEDURES

The equipment required for the collection of QC samples is identical to the equipment required for the collection of environmental samples.

Field QC checks may include submission of trip blank, equipment rinsate, field blank, duplicate, and reference samples to the laboratory. Suggested frequency and types of QC check samples are discussed in the following guidance documents: *RCRA Technical Enforcement Guidance Document*, Section 4.6.1 (EPA 1986); the use and frequency of these field QC samples should be incorporated as appropriate. Types of field QC samples are discussed in general below. The frequency at which field QC samples should be collected for each QC level is provided in Table III-B-1.

The use of performance evaluation (PE) samples is discussed in SOP III-H, *Performance Evaluation Sample Procedures.*

2.1 TRIP BLANK

One trip blank is prepared off site by the laboratory using ASTM Type I organic-free water and included in each shipping container with samples scheduled for analysis of VOCs, regardless of the environmental medium. Trip blanks are placed in sample coolers by the laboratory prior to transport to the site so that they accompany the samples throughout the sample collection/ handling/ transport process. Once prepared, trip blanks remain unopened throughout the transportation and storage processes and are analyzed along with the associated environmental samples. Trip blanks are analyzed for VOCs and reported as water samples, even though the associated environmental samples may be from a matrix such as soil, tissue, or product.

One set of two 40 milliliter vials will constitute a trip blank and will accompany each cooler containing samples to be analyzed for volatile organics (VOCs) by methods such as CLP VOCs, 8010/601, 8020/602, 8240/624, modified 8015 (only if purge and trap analysis is performed, e.g., for gasoline, not for extraction and analysis for diesel fuel), and equivalent state-specific methods. Trip blanks will be analyzed for VOCs only (EPA 1987).

Trip banks are not typically analyzed in association with tissue samples and are therefore not required for tissue sampling programs.

Table III-B-1
Field QC Samples per Sampling Event

	Level C2		Level D2		Level E2	
Type of Sample	Metal	Organic	Metal	Organic	Metal	Organic
Trip blank (for volatiles only)	NA1	1/cooler	NA1	1/cooler	NA[1]	1/cooler
Equipment rinsate[3]	1/day	1/day	1/day	1/day	1/day	1/day
Field blank	1/decontamination water source/event/for all QC levels and all analytes					
Field duplicates[4]	10%	10%	10%	10%	5%	5%

Background samples at least 1/sample media/sample event[5]

Notes:

[1] NA means not applicable.

[2] QC levels are discussed in Section 2.8, Quality Control (QC) Levels.

[3] Samples are collected daily; however, only samples from every other day are analyzed. Other samples are held and analyzed only if evidence of contamination exists.

[4] The duplicate must be taken from the same sample that will become the laboratory matrix/spike duplicate for organics or for the sample used as a duplicate in inorganic analysis.

[5] Sample event is defined from the time sampling personnel arrive at the site until they leave the site for more than a period of one week; the use of controlled-lot source water makes one sample per lot rather than per event an option.

Source: NFESC. 1999. Navy Installation and Restoration Chemical Data Quality Manual.

2.2 EQUIPMENT RINSATE SAMPLES

Equipment rinsate samples are collected by pumping organic-free, analyte-free water over and/or through the sampling equipment (such as a bailer, sampling pump, or mixing bowl) following its final decontamination rinse. This rinse water is collected into the sample containers directly or with the use of a funnel if necessary. The rinse water may be poured by use of an electric or hand submersible pump by tipping the jug of water upside down, or by use of a stopcock.

Equipment rinsate samples are collected daily for sampling equipment used repetitively to collect environmental samples. One equipment rinsate sample shall be collected per day per sampling technique utilized that day (NFESC 1999 and EPA 1986). At least one equipment rinsate sample is analyzed for each group of 20 samples of a similar matrix type and concentration. Equipment rinsate samples are preserved, handled, and analyzed in the same manner as all environmental samples. Analytical results of equipment rinsate samples are used to access equipment cleanliness and the effectiveness of the decontamination process.

When disposable or dedicated sampling equipment is utilized, only one equipment rinsate sample will be collected per equipment lot or project phase. Disposable and/or dedicated sampling equipment may include stainless steel bowls or trowels that will be used for collection of only one soil sample, disposable bailers for ground-water sampling, dedicated submersible pumps for ground-water sampling, or other such equipment. This disposable and/or dedicated sampling equipment is typically pre-cleaned and individually wrapped by the manufacturer prior to delivery to the site. In this case, the equipment rinsate sample is used to provide verification that contaminants are not being introduced to the samples via sampling equipment.

Sampling devices (e.g., gloved hands, dip nets, or traps) for collection of tissue samples are generally non-intrusive into the organisms collected, so equipment rinsate samples will not be collected as long as the devices have been properly cleaned following SOP III-I, *Equipment Decontamination*, and the devices appear clean.

2.3 FIELD BLANKS

Field blanks are generally prepared on site during the sampling event by pouring American Society for Testing and Materials (ASTM) Type I organic-free water into randomly selected sample containers. Commercially available distilled water may be a satisfactory substitute for the ASTM organic-free water depending specific project requirement. At least one field blank is analyzed for each group of 20 samples of a similar matrix type and concentration.

Field blanks, consisting of samples of the source water used as the final decontamination rinse water, will be analyzed to assess whether the wash or rinse water contained contaminants that may have been carried over into the site samples.

The final decontamination rinse water source, the field blank source water, and equipment rinsate source water should all be from the same purified water source. Tap water used for steam cleaning augers or used in the initial decontamination buckets need not be collected and analyzed as a field blank, because augers typically do not touch the actual samples and because the final decontamination rinse water should be from a purified source.

Field blanks are collected at a frequency of one per sampling event per each source of water for all levels of QC. A sampling event is considered to be from the time sampling personnel arrive at a site until they leave for more than a week. Field blanks will be analyzed for the same analyses as the samples collected during the period that the water sources are being used for decontamination. If the same lot of the water source is used, a field blank needs to be collected only once per lot.

2.4 FIELD DUPLICATE

At least one duplicate sample is analyzed from each group of 10 samples of a similar matrix type and concentration. Field duplicate samples should be collected from areas most likely to be contaminated and are preserved, handled, and analyzed in the same manner as all environmental samples. Field duplicates have the same location identification, sampling date and time, and depth interval as the associated environmental sample, but are assigned a unique sample number that is associated with the environmental sample number by virtue of the identical timestamp and location information.

Field duplicates for groundwater and surface water samples will generally consist of replicates. Field duplicates for soil samples will consist primarily of collocates. Soil field duplicates that are to be analyzed for volatile constituents will consist only of collocates; no soil samples that are to be analyzed for volatiles will be replicated (i.e., homogenized or otherwise processed or split) in the field. A separate sample will be collected to provide duplicates for non-volatile analyses. The sample may be homogenized and split in the field to form an original and duplicate (replicate) sample, or an additional volume into a separate sample container may be collected to form a duplicate (collocate) sample. Alternatively, replicates may be formed by homogenization in the laboratory. Duplicates will be analyzed for the same analytical parameters as their associated original sample.

Field duplicates for biological tissue samples will consist of splits of the original sample. Twice the required volume of organisms for one sample will be collected and placed into one food-grade self-sealing bag. The sample will later be homogenized in the laboratory and split, producing an original and a replicate sample. Replicates will be analyzed for the same analytical parameters as their associated original samples.

2.5 REFERENCE SAMPLES

There are two types of background levels of chemicals:

- Naturally occurring levels, which are concentrations of chemicals present in the environment that have not been influenced by humans (e.g., iron, aluminum)
- Anthropogenic levels, which are concentrations of chemicals that are present in the environment due to human-made, non-site sources (e.g., industry, automobiles)

Reference samples are samples taken from media similar to site media, but that are collected outside the zone of contamination, usually offsite.

Reference samples will be collected for each medium sampled at a site. Site-specific conditions will dictate the number of reference samples necessary to characterize background concentrations of contaminants of concern. However, at least one reference sample from each medium will be collected during each sampling event at a site. The samples will be analyzed for all the analytes for which site samples of that medium are analyzed. Background analysis, especially for metals, should be performed to assess the typical naturally occurring levels.

At least one reference sample will be collected for each biological species collected at a site. It may be difficult to find a nearby offsite location similar enough to the project site that has the same biological species available for offsite reference sample collection. Therefore, reference sample locations may need to be more distant from the site than for soil or water offsite reference samples. Collection methods will be identical for site and reference samples.

State-specific procedures may be required to establish background conditions for the site. This SOP is not intended to address such procedures and they should be consulted as necessary.

2.6 TEMPERATURE BLANKS

Temperature blanks are used to measure cooler temperatures upon receipt of the coolers at the laboratory. One temperature blank will be prepared and submitted to the project laboratory with each cooler. The temperature blank will consist of a sample jar containing water, which will be packed in the cooler in the same manner as the rest of the samples and labeled “temperature blank.”

2.7 LABORATORY QUALITY CONTROL SAMPLES

The analytical laboratory uses a series of QC samples specified in each standard analytical method and laboratory SOP to assess laboratory performance. Analyses of laboratory QC samples are performed for samples of similar matrix type and concentration and for each sample batch. The types of laboratory QC samples are matrix spike/matrix spike duplicates, laboratory control standards, laboratory duplicates, method blanks, and surrogates. In addition, there may be other project-specific technical QC requirements.

2.7.1 Matrix Spike/matrix Spike Duplicate

Matrix spike/matrix spike duplicates (MS/MSDs) are used to assess sample matrix interferences and analytical errors, as well as to measure the accuracy and precision of the analysis. For MS or MSD samples, known concentrations of analytes are added to the environmental samples; the samples are then processed through the entire analytical procedure and the recovery of the analytes is calculated. Results are expressed as percent recovery of the known spiked amount for matrix spikes and the relative percent difference (RPD) for MS/MSDs. The MS/MSDs will be collected and analyzed at a rate of 5 percent of the field samples for each matrix and analytical method or at least one for each analytical batch, whichever frequency is greater.

Generally, a specific sampling location is used to collect field QC samples; however, it may not be possible to collect MS/MSD samples for all analyses at the same sampling location because of a limited volume of available material. In those instances, MS/MSD samples designated for various analyses will be collected from different locations (for example a MS/MSD for metals is collected at location X and an MS/MSD for PCBs is collected at location Y). Additionally, samples designated for MS/MSD analyses will not be collected from locations with potentially high concentrations of target analytes that may mask the added spike compounds. MS/MSD samples have the same location identification, sampling time, depth interval, and sample number as the associated environmental sample.

2.8 QUALITY CONTROL (QC) LEVELS

NAVFAC NW QC Levels III, IV are defined in SOP I-A-8 and Data Validation Procedure SOPs II-A through II-O. Level IV QC is appropriate to use for laboratory analysis for sites where cleanup decisions will be based on risk assessment. Sites on or eligible for the National Priorities List (NPL) will also have laboratory analyses conducted at Level IV QC. The QC level selected for laboratory analyses for many sites, therefore, will be NAVFAC NW Level IV. Other QC levels may be appropriate for certain types of samples or analyses; criteria for selection of the appropriate QC level for individual projects and field work activities are discussed in SOP I-A-8, *Data Validation Planning and Coordination*.

3.0 DOCUMENTATION

Records of the collection of field QC samples should be kept in the sample logbook by the methods discussed in SOPs III-E, *Record Keeping, Sample Labeling, and Chain-of-Custody* and III-D, *Logbooks*.

4.0 REFERENCES

EPA. 1987. Data Quality Objectives for Remedial Response Activities: Development Process
NFESC. 1999. Navy Installation and Restoration Chemical Data Quality Manual.
EPA. 1992. RCRA Technical Enforcement Guidance Document.
SOP III-I, Equipment Decontamination
SOP, III-D, *Logbooks*

5.0 ATTACHMENTS

None.

LOGBOOKS

1.0 PURPOSE

This standard operating procedure (SOP) describes the activities and responsibilities of U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) personnel and/or their contractors pertaining to the identification, use, and control of logbooks and associated field data records. This SOP establishes a standard format for recording field observations and describes the methods for use and maintenance of field logbooks.

2.0 PROCEDURE

2.1 EQUIPMENT

- Waterproof hardbound field logbook (typically 4-inch by 7-inch to 8-inch by 10.5-inch) with numbered pages
- Waterproof/indelible marking pen
- Ruler/straight edge
- Clipboard

2.2 LOGBOOK MAINTENANCE

Prior to commencement of field work, logbooks will be assigned to field personnel by the Project Manager. If personnel changes must be made during a project, the successor may use the same logbook. In this case, the logbook cover page will indicate all persons who have made entries and the dates. This may be inappropriate if there are a large number of people involved.

The logbook user is responsible for recording pertinent data into the logbook to satisfy project requirements and for attesting to the accuracy of the entries by dated signature. The logbook user is also responsible for safeguard of the logbook while having custody of it.

Individuals performing specific tasks associated with a field project may keep a separate logbook; however, these logbooks must conform to this procedure and will become a permanent part of the central project file. The Project Manager is responsible for reviewing and signing all field logbooks associated with the project.

2.3 RECORDING FIELD ACTIVITIES

The field team provides a permanent record of daily activities, observations, and measurements through the use of a field logbook. All logbook entries will be made in indelible black or blue ink. No erasures are permitted. If an incorrect entry is made, the data will be crossed out with a single line and initialed and dated by the originator. Entries can be organized into easily understood tables if possible.

All logbook pages will be signed and dated at the bottom. Times will be recorded next to each entry. If a full page is not used during the course of a workday, a diagonal line will be drawn through the unused portion of the page and signed (in this case, it would not be necessary to sign the bottom of the page). If the project is completed and the logbook has not been completely filled, a diagonal line will be drawn across the first blank page after the last entry, and “no further entries” written before the page is signed and dated.

Daily entries will be made during field activities by, at a minimum, one field team member to provide daily records of all significant events, observations, and measurements during field operations. Notes will start at the beginning of the first blank page and extend through as many pages as necessary. All page numbers will be consecutively numbered as the logbook is filled.

The inside cover page of each logbook will contain the following information:

- Book number
- Project name
- Contract number
- Project number
- Navy Activity/Installation
- Site name
- Start date
- End date
- Person to whom the logbook is assigned
- Agency/Company name
- Agency/Company address
- Agency/Company phone number

The field logbook serves as the primary record of field activities. When possible, the field book should be dedicated to a singular Navy Activity/Installation to facilitate long-term records archiving. Entries shall be made chronologically and in sufficient detail to allow the writer or a knowledgeable reviewer to reconstruct the applicable events. Individual data forms may be generated to provide systematic data collection documentation. Entries on these forms shall meet the same requirements as entries in the logbook and shall be referenced in the applicable logbook entry. Individual data forms shall reference the applicable logbook and page number. At a minimum, names of all samples collected shall be included in the logbook even if recorded elsewhere.

All field descriptions and observations are entered into the logbook, as described in Attachment III-D-1.

Typical information to be entered includes, but is not limited to, the following:

- Date and time of all onsite activities
- Site location and description
- Weather conditions
- Field work documentation
- Descriptions of and rationale for approved deviations from the Work Plan or Field Sampling Plan
- Field instrumentation readings
- Personnel present
- Photograph references

- Sample locations
- Sample identifications, as described in SOP I-A-11, Sample Naming
- Field QC sample information
- Field descriptions, equipment used, and field activities accomplished to reconstruct field operations
- Meeting information
- Daily health and safety meeting notes
- Important times and dates of telephone conversations, correspondence, or deliverables
- Field calculations
- PPE level
- Calibration records
- Subcontractors present
- Equipment decontamination procedures and effectiveness
- Procedures used for containerization of investigative-derived waste

Logbook page numbers shall appear on each page to facilitate identification of photocopies.

If a person's initials are used for identification, or if uncommon acronyms are used, these should be identified on a page at the beginning of the logbook.

At least weekly and preferably daily, the preparer shall photocopy and retain the pages completed during that session for backup. This will prevent loss of a large amount of information if the logbook is lost.

A technical review of each logbook shall be performed by a knowledgeable individual such as the Project Manager.

3.0 DOCUMENTATION

The field logbook shall be retained as a permanent project record. If a particular Task Order requires submittal of photocopies of logbooks, this shall be performed as required.

4.0 REFERENCES

SOP I-A-11, *Sample Naming*

5.0 ATTACHMENTS

Attachment III-D-1 Description of Logbook Entries

Attachment 1
Description of Logbook Entries

Logbook entries shall contain the following information, as applicable, for each activity recorded. Some of these details may be entered on data forms as described previously.

Name of Activity	For example, Asbestos Bulk Sampling, Charcoal Canister Sampling, Aquifer Testing.
Task Team Members and Equipment	Name all members on the field team involved in the specified activity. List equipment used by serial number or other unique identification, including calibration information.
Activity Location	Indicate location of sampling area as specified in the Field Sampling Plan. Record valid Navy Installation/Active and Site, at a minimum.
Weather	Indicate general weather and precipitation conditions.
Level of Personal Protective Equipment	The level of personal protective equipment (PPE), e.g., Level D, should be recorded.
Methods	Indicate method or procedure number employed for the activity.
Sample IDs	Indicate the unique identifier associated with the physical samples. Identify QC samples. Value can be numeric or alphanumeric and must not already exist in the database.
Sample Type and Volume	Indicate the medium, container type, preservative, and the volume for each sample.
Sample Collection Information	Indicate the location of sample, date and time of collection, sample matrix, sample depth interval, sample methods, sample handling, including filtration and preservation, analysis required and packaging and shipping information.
Time and Date	Record the time and date when the activity was performed (e.g., 0830/08/OCT/89). Use the 24-hour clock for recording the time and two digits for recording the day of the month and the year.
Analyses	Indicate the appropriate code for analyses to be performed on each sample, as specified in the Field Sampling Plan.
Field Measurements	Indicate measurements and field instrument readings taken during the activity.
Chain of Custody and Distribution	Indicate chain-of-custody for each sample collected and indicate to whom samples are transferred and the destination.
References	If appropriate, indicate references to other logs or forms, drawings or photographs employed in the activity.

Narrative (including time and location)	Create a factual, chronological record of the team's activities throughout the day, including the time and location of each activity. Include descriptions of any general problems encountered and their resolution. Provide the names and affiliations of non-field team personnel who visit the site, request changes in activity, impact to the work schedule, requested information, or observe team activities. Record any visual or other observations relevant to the activity, the contamination source, or the sample itself. It should be emphasized that logbook entries are for recording data and chronologies of events. The logbook author must include observations and descriptive notations, taking care to be objective and recording no opinions or subjective comments unless appropriate.
Recorded by	Include the signature of the individual responsible for the entries contained in the logbook and referenced forms.
Checked by	Include the signature of the individual who performs the review of the completed entries.

RECORD KEEPING, SAMPLE LABELING, AND CHAIN-OF-CUSTODY PROCEDURES

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish standard protocols for all U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) field personnel and their contractors for use in maintaining field and sampling activity records, writing sample logs, labeling samples, ensuring that proper sample custody procedures are utilized, and completing chain-of-custody/analytical request forms.

2.0 PROCEDURES

Standards for documenting field activities, labeling the samples, documenting sample custody, and completing chain-of-custody and analytical request forms are provided in this procedure. The standards presented in this section shall be followed to ensure that samples collected are maintained for their intended purpose and that the conditions encountered during field activities are documented.

2.1 RECORD KEEPING

The field logbook serves as the primary record of field activities. Entries shall be made chronologically and in sufficient detail to allow the writer or a knowledgeable reviewer to reconstruct each day's events. Field logs such as soil boring logs and ground-water sampling logs will also be used. These procedures are described in SOP III-D, *Logbooks*.

2.2 SAMPLE LABELING

A sample label with adhesive backing shall be affixed to each individual sample container. Clear tape shall be placed over each label (preferably prior to sampling) to prevent the labels from tearing off, falling off, or being smeared, and to prevent loss of information on the label. The following information shall be recorded with a waterproof marker on each label:

- Project name or number (optional)
- Sample ID
- Date and time of collection
- Sampler's initials
- Matrix (optional)
- Sample preservatives (if applicable)
- Analysis to be performed on sample. This shall be identified by the method number or name identified in the subcontract with the laboratory. For water samples, a separate container is typically used for each separate test method, whereas with soil samples, multiple analyses can be performed on the soil obtained from one sample container. In order to avoid lengthy lists on each container and confusion, soil sample containers may not list every analysis to be performed.

These labels may be obtained from the analytical laboratory or printed from a computer file onto adhesive labels. The adhesive glue used on the labels must be such that it does not contaminate the sample.

2.3 CUSTODY PROCEDURES

For samples intended for chemical analysis, sample custody procedures shall be followed through collection, transfer, analysis, and disposal to ensure that the integrity of the samples is maintained. Custody of samples shall be maintained in accordance with EPA chain-of-custody guidelines as prescribed in EPA's *NEIC Policies and Procedures*, National Enforcement Investigations Center, Denver, Colorado, revised May 1986; EPA *RCRA Ground Water Monitoring Technical Enforcement Guidance Document* (TEGD), *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA OSWER Directive 9355 3-01), Appendix 2 of the *Technical Guidance Manual for Solid Waste Water Quality Assessment Test (SWAT) Proposals and Reports*, and *Test Methods for Evaluating Solid Waste* (EPA SW-846). A description of sample custody procedures is provided below.

2.3.1 Sample Collection Custody Procedures

According to EPA's *NEIC Policies and Procedures*, a sample is considered to be in custody if:

- It is in one's actual physical possession or view
- It is in one's physical possession and has not been tampered with (i.e., it is under lock or official seal)
- It is retained in a secured area with restricted access
- It is placed in a container and secured with an official seal such that the sample cannot be reached without breaking the seal

Custody seals shall be placed on sample containers immediately after sample collection and on shipping coolers if the cooler is to be removed from the sampler's custody. Custody seals will be placed in such a manner that they must be broken to open the containers or coolers. The custody seals shall be labeled with the following information:

- Sampler's name or initials
- Date and time that the sample/cooler was sealed.

These seals are designed to enable detection of sample tampering. An example of a custody seal is shown in Attachment III-E-1.

Field personnel shall also log individual samples onto carbon copy chain-of-custody forms when a sample is collected. These forms may also serve as the request for analyses. Procedures for completing these forms are discussed in Section 2.4 indicating sample number, matrix, date and time of collection, number of containers, analytical methods to be performed on the sample, and preservatives added (if any). The samplers will also sign the COC form signifying that they were the personnel who collected the samples. The COC form shall accompany the samples from the field to the laboratory. When a cooler is ready for shipment to the analytical laboratory, the person delivering the samples for transport will sign and indicate the date and time on the accompanying COC form. One copy of the COC form will be retained by the sampler and the remaining copies of the COC form shall be placed inside a self-sealing bag and taped to the inside of the cooler. Each cooler must be associated with a unique COC form. Whenever a transfer of custody takes place, both parties shall sign and date the accompanying carbon copy COC forms, and the individual relinquishing the samples shall retain a copy of each form. One exception is when the samples are shipped; the delivery service personnel will not sign or receive a copy because they do not open the coolers. The laboratory shall attach copies of the completed COC forms to the reports containing the results of the analytical tests. An example COC form is provided in Attachment III-E-2. An example of a completed COC form is provided in Attachment III-E-3 and described in Section 2.4.

2.3.2 Laboratory Custody Procedures

The following are custody procedures to be followed by an independent laboratory receiving samples for chemical analysis; the procedures in their Laboratory Quality Assurance Plan (LQAP) must follow these same procedures. A designated sample custodian shall take custody of all samples upon their arrival at the analytical laboratory. The custodian shall inspect all sample labels and COC forms to ensure that the information is consistent, and that each is properly completed. The custodian will also measure the temperature of the samples in the coolers upon arrival. The custodian shall also note the condition of the samples including:

- If the samples show signs of damage or tampering.
- If the containers are broken or leaking.
- If headspace is present in sample vials.
- Proper preservation of samples (made by pH measurement, except VOCs and purgeable TPH). The pH of these samples will be checked by the laboratory analyst, after the sample aliquot has been removed from the vial for analysis.
- If any sample holding times have been exceeded.

All of the above information shall be documented on a sample receipt sheet by the custodian. Any discrepancy or improper preservation shall be noted by the laboratory as an out-of-control event and shall be documented on an out-of-control form with corrective action taken. The out-of-control form shall be signed and dated by the sample control custodian and any other persons responsible for corrective action. An example of an out-of-control form is included as Attachment III-E-4.

The custodian shall then assign a unique laboratory number to each sample and distribute the samples to secured storage areas maintained at 4°C. The unique laboratory number for each sample, contractor sample ID, client name, date and time received, analysis due date, and storage details shall also be manually logged onto a sample receipt record and later entered into the laboratory's computerized data management system. The custodian shall also sign the shipping bill and maintain a copy.

Laboratory personnel shall be responsible for the care and custody of samples from the time of their receipt at the laboratory through their exhaustion or disposal. Samples should be logged in and out on internal laboratory COC forms each time they are removed from storage for extraction or analysis.

2.4 COMPLETING CHAIN-OF-CUSTODY/ANALYTICAL REQUEST FORMS

COC form/analytical request completion procedures are crucial in properly transferring the custody and responsibility of samples from field personnel to the laboratory. This form also is important for accurately and concisely requesting analyses for each sample; it is essentially a release order from the analysis subcontract.

Attachment III-E-2 is an example of a generic COC/analytical request form that may be used by field personnel. Multiple copies may be tailored to each project so that much of the information described below need not be handwritten each time. Attachment III-E-3 is an example of a completed site-specific COC/analytical request form, with box numbers identified and discussed in text below.

Box 1 Project Manager: This name shall be the name that will appear on the report. Do not write the name of the Project Coordinator or point of contact for the project instead of the Project Manager.

Project Name: Write it, as it is to appear on the report.

Project Number: Write it as it is to appear on the report. It shall include the project number, task number, and general ledger section code. The laboratory subcontract number should also be included.

Box 2 Bill to: List the name and address of the person/company to bill only if it is not in the subcontract with the laboratory.

Box 3 Sample Disposal Instructions: These instructions will be stated in the Basic Ordering Agreement (BOA) or each Task Order statement of work with each laboratory.

Shipment Method: State the method of shipment, e.g., hand carry; air courier via FEDEX, AIRBORNE, DHL or equivalent.

Comment: This area shall be used by the field team to communicate observations, potential hazards, or limitations that may have occurred in the field or additional information regarding analysis. For example: a specific metals list, explanation of Mod 8015, Mod 8015 + Kerosene, samples expected to contain high analyte concentrations.

Box 4 Cooler Number: This will be written somewhere on the inside or outside of the cooler and shall be included on the COC. Some laboratories attach this number to the trip blank identification, which helps track VOC samples. If a number is not on the cooler, field personnel shall assign a number, write it on the cooler, and write it on the COC.

QC Level: Enter the reporting/QC requirements, e.g., NAVFAC NW QC Level C, D, or E.

Turnaround time (TAT): TAT for contract work will be determined by a sample delivery group (SDG), which may be formed over a 14-day period, not to exceed 20 samples. Standard turnaround time once the SDG has been completed is 35 calendar days from receipt of the last sample in the SDG. Entering NORMAL or STANDARD in this field will be acceptable. If quicker TAT is required, it shall be in the subcontract with the laboratory and reiterated on each COC to remind the laboratory.

Box 5 Type of containers: The type of container used, e.g., 1-liter glass amber, for a given parameter in that column.

Preservatives: Field personnel must indicate on the COC the correct preservative used for the analysis requested. Indicate the pH of the sample (if tested) in case there are buffering conditions found in the sample matrix.

Box 6 Sample number: Five-character alpha-numeric identifier to be used by the laboratory to identify samples. The use of this identifier is important since the labs are restricted to the number of characters they are able to use. See SOP I-A-11, Sample Naming.

Description (sample identification): This name will be determined by the location and description of the sample, as described in SOP I-A-11, Sample Naming. This sample identification should not be submitted to the laboratory, but should be left blank. If a computer COC version is used, the sample identification can be input but printed with this block black. A cross-referenced list of sample number and sample identification must be maintained separately.

Date Collected: Collection date must be recorded in order to track the holding time of the sample. Note: For trip blanks, record the date it was placed in company with samples.

Time Collected: When collecting samples, record the time the sample is first collected. Use of the 24-hour military clock will avoid a.m. or p.m. designations; e.g., 1815 instead of 6:15 p.m. Record local time; the laboratory is responsible for calculating holding times to local time.

Lab Identification: This is for laboratory use only.

Box 7 Matrix and QC: Identify the matrix: e.g., water, soil, air, tissue, fresh water sediment, marine sediment, or product. If a sample is expected to contain high analyte concentrations, e.g., a tank bottom sludge or distinct product layer, notify the laboratory in the comment section. Mark an "X" for the sample(s) that have extra volume for laboratory QC matrix spike/matrix spike duplicate (MS/MSD) purposes. The sample provided for MS/MSD purposes is usually a field duplicate.

Box 8 Analytical Parameters: Enter the parameter by descriptor and the method number desired. When requesting metals that are modifications of the standard lists, define the list in the comment section. This would not be necessary when requesting standard list metals such as priority pollutant metals (PPM), target compound list from ILM03.0, and Title 22 metals which are groups of metals commonly requested and should not cause any confusion as to what metals are being analyzed. Whenever possible, list the parameters as they appear in the laboratory subcontract to maintain consistency and avoid confusion.

In the boxes below the analytical parameter, indicate the number of containers collected for each parameter by marking an "X". If more than one container is used for a sample, write a number in the desired box to indicate a request for analysis and to indicate the number of containers sent for that analysis.

Box 9 Sampler's Signature: The person who collected samples must sign here.

Relinquished By: This space shall contain the signature of the person who turned over the custody of the samples to a second party other than an express mail carrier such as FEDEX, DHL or Air Borne Express.

Received By: Typically, this is a written signature by a representative of the receiving laboratory, or a field crewmember who delivered the samples in person from the field to the laboratory. A courier such as FedEx or DHL does not sign because they do not open the coolers. It must also be used by the prime contracting laboratory when samples are sent to a subcontractor.

Relinquished By: In the case of subcontracting, the primary laboratory will sign the Relinquished By space and fill out an additional COC to accompany the samples being subcontracted.

Received By (Laboratory): This space is for the final destination (e.g., at a subcontracted laboratory).

Box 10 Lab Number and Questions: This box is to be filled in by the laboratory only.

Box 11 Control Number: This number is the "COC" followed by the first sample number in a cooler, or contained on a COC. This control number must be unique and never used twice. Record the date the COC is completed. It should be the same date the samples are collected.

Box 12 Total No. of Containers/row: Sum the number of containers in that row.

Box 13 Total No. of Containers/column: Sum the number of containers in that column.

Because COC forms contain different formats based upon who produced the form, not all of the information listed in items 1 to 13 may be recorded. However, as much of this information as possible shall be included.

COC forms tailored to each Task Order can be drafted and printed onto multi-ply forms. This eliminates the need to rewrite the analytical methods column headers each time. It also eliminates the need to write the project manager, name, and number; QC Level; TAT; and the same general comments each time.

Complete one COC form per cooler. Whenever possible, reduce the number of trip blanks by placing all samples to be analyzed for VOA, gasoline, and BTEX compounds into one cooler.

Complete all sections and be sure to sign and date the COC form. One copy of the COC form must remain with the field personnel.

3.0 DOCUMENTATION

The COC/analytical request form shall be faxed daily, if possible, to the Task Order Laboratory Coordinator for accuracy verification. Following the completion of sampling activities, the sample logbook and COC forms will be transmitted to the Project Manager for storage in project files. The Project Manager shall review COC forms on a monthly basis at a minimum. The data validators shall also receive a copy. Along with the data delivered, the original COC/analytical request form shall be submitted by the laboratory. Any changes to the analytical requests that are required shall be made in writing to the laboratory. A copy of this written change shall be sent to the data validators and placed in the project files. The reason for the change shall be included in the project files so that recurring problems can be easily identified.

4.0 REFERENCES

SOP I-A-11, *Sample Naming*
SOP III-D, *Logbooks*
State of California Water Resources Control Board. 1988. Technical Guidance Manual for Solid Waste Water Quality Assessment Test (SWAT) Proposals and Reports.
USEPA. 1986. EPA NEIC Policies and Procedures, National Enforcement Investigations Center, Denver, Colorado.
USEPA. 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA OSWER Directive 9355 3-01).
USEPA. 1992. RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD).
USEPA. 1995 and as updated. Test Methods for Evaluating Solid Waste (SW-846), Third edition.

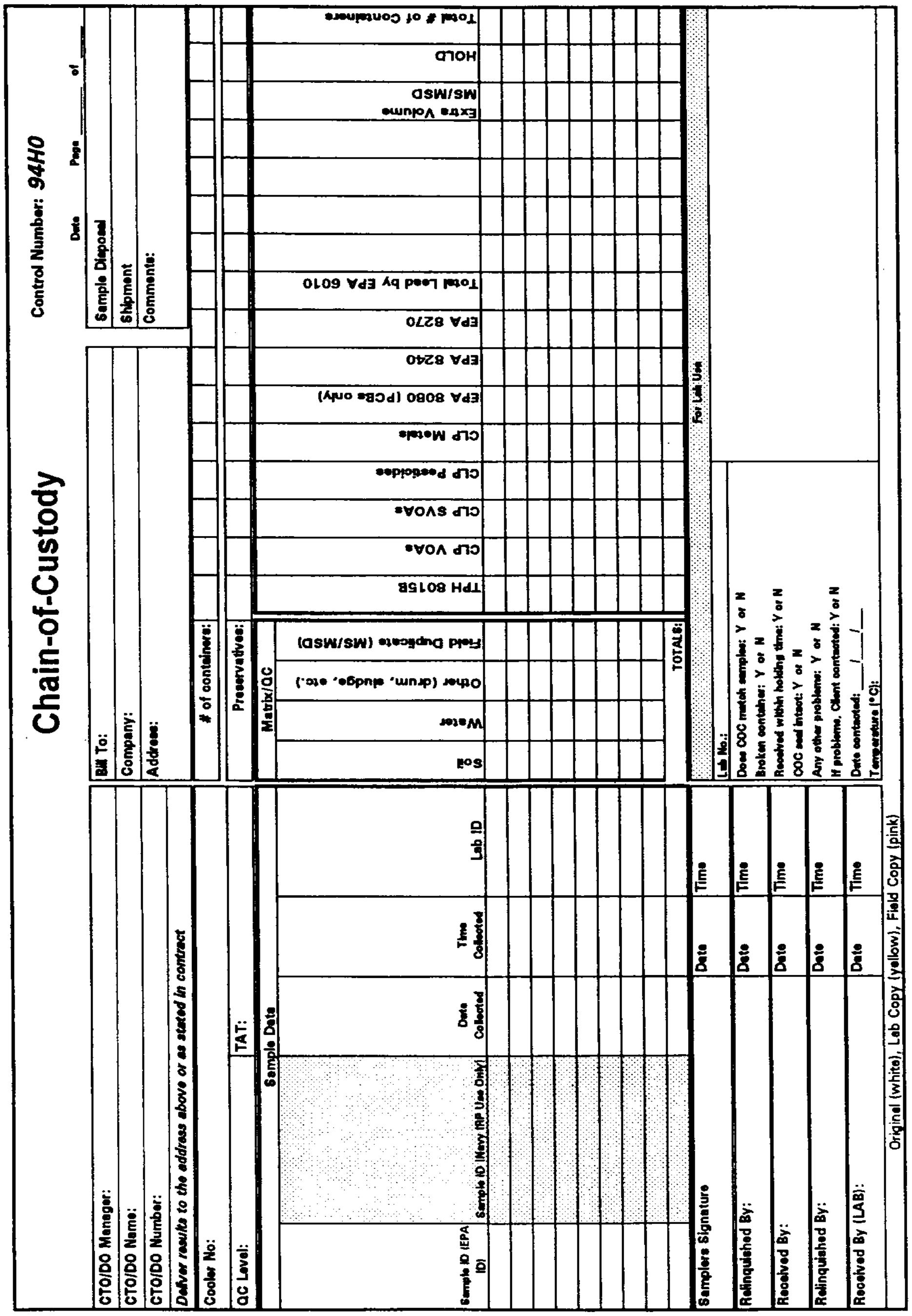
5.0 ATTACHMENTS

Attachment III-E-1	Chain-of-Custody Seal
Attachment III-E-2	Generic Chain-of-Custody/Analytical Request Form
Attachment III-E-3	Sample Completed Chain-of-Custody/Analytical Request Form
Attachment III-E-4	Sample Out-of-Control Form

Attachment III-E-1
Chain-of-Custody Seal

[LABORATORY]	SAMPLE NO.	DATE	SEAL BROKEN BY
	SIGNATURE		DATE
	PRINT NAME AND TITLE (Inspector, Analyst or Technician		

Attachment III-E-2
Generic Chain-of-Custody/Analytical Request Form



Chain-of-Custody

Control Number: 94H0

Date Page ______ of ______

CTO/DO Manager:

CTO/DO Name:

CTO/DO Number:

Deliver results to the address above or as stated in contract

Cooler No:

QC Level:

TAT:

Bill To:

Company:

Address:

Sample Disposal

Shipment

Comments:

# of containers:

Preservatives:

Sample Data

Sample ID (EPA ID)	Sample ID (Navy IRP Use Only)	Date Collected	Time Collected	Lab ID

Matrix/QC

Soil	Water	Other (drum, sludge, etc.)	Field Duplicate (MS/MSD)	TPH 8015B	CLP VOAs	CLP SVOAs	CLP Pesticides	CLP Metals	EPA 8080 (PCBs only)	EPA 8240	EPA 8270	Total Lead by EPA 6010				Extra Volume MS/MSD	HOLD	Total # of Containers
			TOTALS:															

Samplers Signature	Date	Time
Relinquished By:	Date	Time
Received By:	Date	Time
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

For Lab Use

Lab No.:

Does COC match samples: Y or N

Broken container: Y or N

Received within holding time: Y or N

COC seal intact: Y or N

Any other problems: Y or N

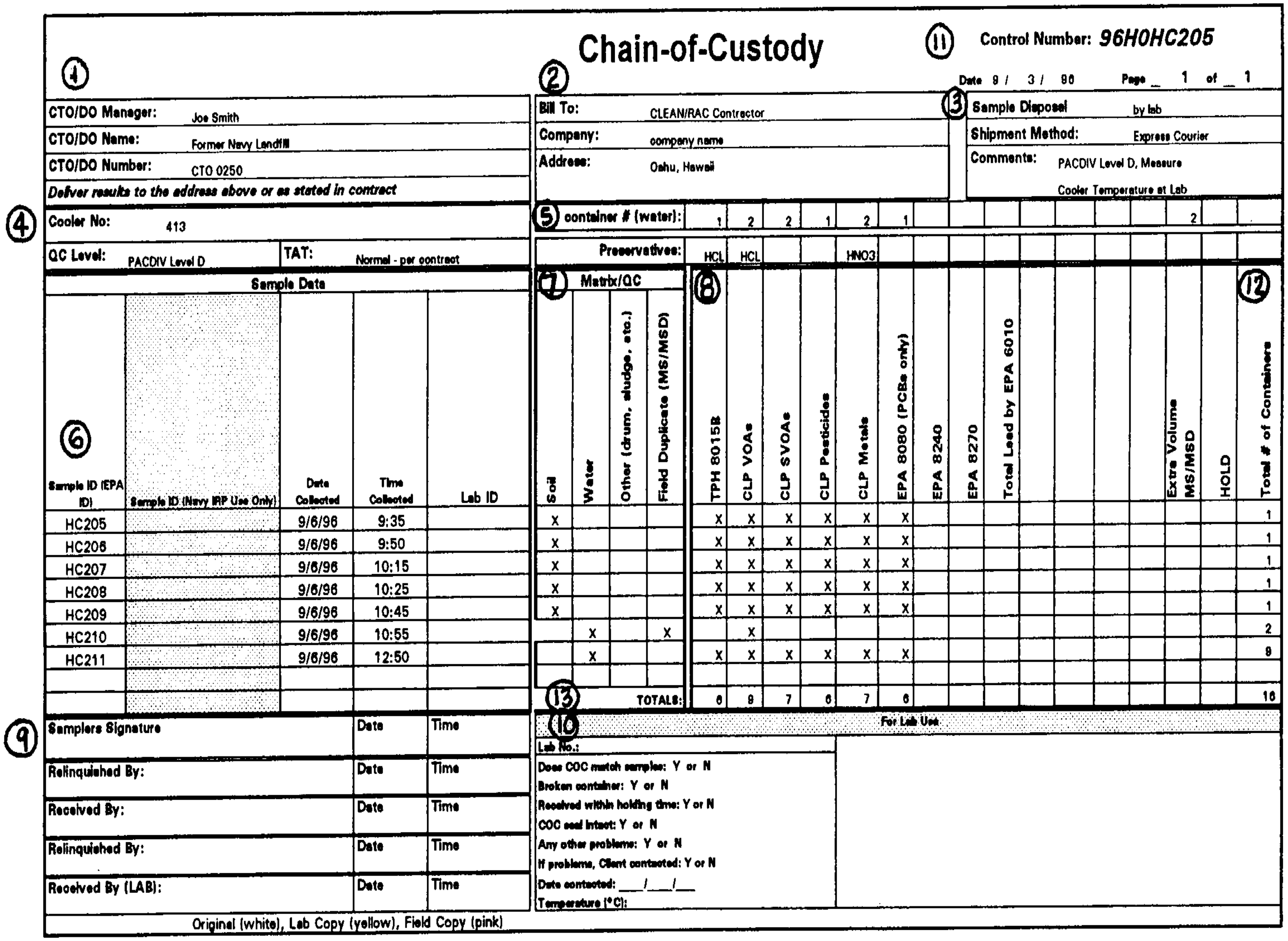
If problems, Client contacted: Y or N

Date contacted: ___/___/___

Temperature (°C):

Original (white), Lab Copy (yellow), Field Copy (pink)

Attachment III-E-3
Sample Completed Chain-Of-Custody/ Analytical Request Form



Chain-of-Custody

⑪ Control Number: 96H0HC205

Date 9 / 3 / 96 Page 1 of 1

①
CTO/DO Manager: Joe Smith
CTO/DO Name: Former Navy Landfill
CTO/DO Number: CTO 0250
Deliver results to the address above or as stated in contract

②
Bill To: CLEAN/RAC Contractor
Company: company name
Address: Oahu, Hawaii

③
Sample Disposal: by lab
Shipment Method: Express Courier
Comments: PACDIV Level D, Measure Cooler Temperature at Lab

④
Cooler No: 413
QC Level: PACDIV Level D
TAT: Normal - per contract

					⑦ Matrix/QC				⑧														⑫
				⑤ container # (water):					1	2	2	1	2	1							2		
				Preservatives:					HCL	HCL			HNO3										
⑥ Sample ID (EPA ID)	Sample ID (Navy IRP Use Only)	Date Collected	Time Collected	Lab ID	Soil	Water	Other (drum, sludge, etc.)	Field Duplicate (MS/MSD)	TPH 8015B	CLP VOAs	CLP SVOAs	CLP Pesticides	CLP Metals	EPA 8080 (PCBs only)	EPA 8240	EPA 8270	Total Lead by EPA 6010				Extra Volume MS/MSD	HOLD	Total # of Containers
HC205		9/6/96	9:35		X				X	X	X	X	X	X									1
HC206		9/6/96	9:50		X				X	X	X	X	X	X									1
HC207		9/6/96	10:15		X				X	X	X	X	X	X									1
HC208		9/6/96	10:25		X				X	X	X	X	X	X									1
HC209		9/6/96	10:45		X				X	X	X	X	X	X									1
HC210		9/6/96	10:55			X		X		X													2
HC211		9/6/96	12:50			X			X	X	X	X	X	X									8
					⑬			TOTALS:	6	8	7	6	7	6									16

⑨		
Samplers Signature	Date	Time
Relinquished By:	Date	Time
Received By:	Date	Time
Relinquished By:	Date	Time
Received By (LAB):	Date	Time

⑩ For Lab Use
Lab No.:
Does COC match samples: Y or N
Broken container: Y or N
Received within holding time: Y or N
COC seal intact: Y or N
Any other problems: Y or N
If problems, Client contacted: Y or N
Date contacted: ___/___/___
Temperature (°C):

Original (white), Lab Copy (yellow), Field Copy (pink)

Attachment III-E-4
Sample Out-Of-Control Form

OUT OF CONTROL FORM	Status	Date	Initial
	Noted OOC		
	Submit for CA*		
	Resubmit for CA*		
	Completed		

Date Recognized:	By:
Dated Occurred:	Matrix
Parameter (Test Code):	Method:
Analyst:	Supervisor:

Samples Affected (List by Accession AND Sample No.)

1. Type of Event (Check all that apply)		2. Corrective Action (CA)* (Check all that apply)	
☐	Calibration Corr. Coefficient <0.995	☐	Repeat calibration
☐	%RSD>20%	☐	Made new standards
☐	Blank >MDL	☐	Reran analysis
☐	Does not meet criteria:	☐	Sample(s) redigested and rerun
☐	Spike	☐	Sample(s) reextracted and rerun
☐	Duplicate	☐	Recalculated
☐	LCS	☐	Cleaned system
☐	Calibration Verification	☐	Ran standard additions
☐	Standard Additions	☐	Notified
☐	MS/MSD	☐	Other (please explain)
☐	BS/BSD		
☐	Surrogate Recovery		
☐	Calculations Error		
☐	Holding Times Missed		
☐	Other (Please explain	Comments:	

3. Results of Corrective Action	
☐	Return to Control (indicated with)
☐	Corrective Actions Not Successful - DATA IS TO BE FLAGGED with _____________.

Analyst:	Date:
Supervisor:	Date:
QA Department:	Date:

SAMPLE CONTAINERS AND PRESERVATION

1.0 PURPOSE

This standard operating procedure (SOP) describes the conventional containers used for sample collection and delivery to a laboratory for analysis. Additionally it will discuss sample preservation and holding times.

2.0 PROCEDURES

The purpose of sample preservation is to prevent or retard the degradation and modification of chemicals or to retard biological activity in samples during transit and storage. Efforts to preserve the integrity of the samples must be initiated as soon as possible after the time of sampling and continue until analyses are performed. Preservatives must be added to the sample container as soon as possible after the time of sample collection. The recommended procedure is to request that bottles be provided by the analytical laboratory and be pre-preserved.

Complete and unequivocal preservation of samples, domestic sewage, industrial wastes, or natural waters, is impossible in practice. Regardless of the nature of the sample, complete stability for every constituent is not likely to be achieved. At best, preservation techniques can retard the chemical and biological changes that inevitably continue after the sample is removed from the parent source. Degradation of the sample ceases only if it is preserved at a temperature of absolute zero (-273°C). However, freezing of a sample to extend hold times is not permitted. Therefore, as a general rule, it is best to analyze the samples as soon as possible after collection. This is especially true when the analyte concentration is expected to be in the low microgram per liter (mg/l) range.

Methods of preservation are relatively limited and are intended generally to perform the following:

- Retard biological action
- Retard hydrolysis of chemical compounds and complexes
- Reduce volatility of constituents
- Reduce absorption effects

Preservation methods are generally:

- pH control
- Chemical addition

- Refrigeration and/or chilling using ice

The recommended preservative for various constituents is given in the Exhibits at the end of this SOP. Preservation techniques for some analyses requiring more than simple refrigeration or filtering are discussed in Section 2.2. The exhibits also provide the estimated volume of sample required for the analysis, the suggested type of container, and the maximum recommended holding times for samples to be properly preserved.

When selecting preservation techniques and sample container type, always refer to the guidance provided in the documentation of the analytical methods to be used.

2.1 SAMPLE CONTAINERS

Select sample containers based on the analytical parameters of interest. Use containers made of materials that are non-reactive. Glass and polyethylene containers are the most commonly accepted, and both are used when sampling many constituents. When metals are the analytes of interest, however, polyethylene containers with Teflon-lined caps are preferred. When organics are the analytes of interest, use glass containers with Teflon-lined caps.

2.2 SAMPLE PRESERVATION

Utilize pre-preserved sample bottles whenever possible. If this is not possible or practical, perform appropriate chemical preservation in the field for various analytical parameters as soon as possible after the time of sample collection. Cool samples after collection and during shipment. All samples should be kept out of direct sunlight as much as possible and stored in the dark (e.g., in a cooler). Regardless of the method of preservation, analyses should be performed as soon after sampling as possible.

In some instances, the optimal method for sample preservation may be inappropriate due to the restrictions placed on the transport of certain chemicals by shippers. When shipping restrictions prevent the use of some reagents for sample preservation, use the most appropriate and permissible technique. The project chemist or laboratory should be able to assist in deciding the best alternative method of preservation.

2.3 MAXIMUM HOLDING TIME

Complete and unequivocal preservation of a sample for an extended period of time is a practical impossibility. Regardless of the nature of the sample, complete stability for every constituent is not likely to be achieved. Maximum holding times are assigned to each analyte and are designed for quality assurance purposes to minimize degradation effects on the analysis. Therefore, as a rule, it is better to analyze the sample as soon as possible after collection. This is especially true when low contaminant concentrations are expected.

2.4 REVIEW

The Field Manager or an approved designee shall check all sample control documentation to ensure that the samples, transport, and analysis events have met the criteria outlined in this SOP and the field sampling plan. Any discrepancies shall be noted and the documentation will be returned to the originator for correction or explanation. The reviewer will acknowledge that corrections have been incorporated by signing and dating each reviewed document.

3.0 DOCUMENTATION

All sample collection information must be recorded within the field logbook. Each sample collected will be clearly associated with a sample type (i.e. normal, field duplicate, equipment blank) sample location, matrix type, collection time, collection date, analysis and sampling depth if appropriate.

With every sample submitted for analysis, a completed chain of custody (COC) must accompany the shipment and a copy retained for the project records. The COC/analytical request form must be used to track all sample identifiers.

4.0 REFERENCES

None.

5.0 ATTACHMENTS

Attachment III-F-1	Example Sample Collection Form

Attachment III-F-1
Example Sample Collection Form

FORM 11-2
SAMPLE COLLECTION INFORMATION

Installation ID:

Establishing Contract ID:

Prime Contractor Name:

Site Name:

DO/CTO:

Establishing Phase:

Collection Date:

Location Name	Sample Name	Depth Range (feet bgs)		Collection Time	Sample Matrix	Sample Type	Sampling Equipment	Composite (Y/N)
		Start Depth	End Depth					

Sampling Equipment

2V	Double Van Veen Grab
AC	Air Canister
AP	Pump - Air Lift (bladder)
AS	Ashing
B	Bailer
BR	Brass (California) Ring
BS	Beach Seine
C	Continuous Flight Auger
CC	Continuous Core Sampler
CH	Charcoal Sampling Tube
CL	Clover Leaf Dredge Sampler
CN	Cone Penetrometer
CO	Core Sampler
CP	Pump - Centrifugal
DF	Diffusion Bag Samplers
DG	Drill Rig
DS	Dredge Sampler (brass, etc.)
DT	Driver Tube (geoprobe, direct push, CPT rig)
E2	Pump - Electric Submersible
EC	Encore Soil Sampler
FC	Cassette Filter
G	Grab
GP	Gas-Operated, Double Acting Piston Pump
H	Hollow Stem Auger
HA	Hand Auger
HB	Bucket Auger
HC	Hand Collected
HD	Hand Drill - Portable Powered
HK	Hook and Line
HP	Hydropunch
HU	Air Sampler - High Volume w/puf Resin
HV	Air Sampler - High Volume
HX	Air Sampler - High Volume w/XAD Resin
IF	Isolation Flux Chamber
LV	Air Sampler - Low Volume Continuous
LY	Lysimeter
MPPS	Micro Push Point Sampler
NC	Nickel Coated Brass Bomb Sampler
NX	NX Rock Coring
PP	Pump - Peristaltic
PS	Passive Soil Gas Sampling Probe
PU	Pump - Standard, Type not Recorded
RS	Hollow Glass Sampling Rod
SC	Scoop/Trowel
SD	Sediment Drag or Sled
SK	Skimmer
SS	Split Spoon
ST	Submersible Turbine Pump
SY	Syringe
T	Shelby Tube/ASTM-D1587
TB	Tedlar Bag
TL	Trawl
TR	Animal Trap
TS	Thief Sampler and/or Thief Type Sampler
UNK	Unknown
VC	Vacuum (gas)
VS	Van Dorn Sampler
VV	Van Veen
W	Swab or Wipe
WB	Westbay Sampling System

Recorder: ____________________ Date: ____________

Checker____________________ Date: ____________

Attachment III-F-1 (Continued)
Example Sample Collection Form

Sample Matrix					
AA	Ambient Air	MA	Mastic	WI	Ground Water Influent (into system)
AC	Composite Air Sample	MO	Mortar	WL	Leachate
ACS	Air - Crawlspace	MR	Marine Sediment	WM	Marine Water
AD	Air - Drilling	MS	Metal Shavings	WN	Porewater
AI	Air - Indoor	NS	Near-Surface Soil	WO	Ocean Water
AIN	Integrated Air Sample	PA	Paper	WP	Drinking Water
AIR-ABS	Activity Based Sampling (ABS) Air Sample	PC	Paint Chips	WQ	Water for QC Samples
AO	Air - Outdoor	PP	Precipitate	WR	Ground Water Effluent (from system)
AQ	Air Quality Control Matrix	RE	Residue	WS	Surface Water
AQS	Aqueous	RK	Rock	WT	Composite Ground Water Sample
ASB	Asbestos	SB	Bentonite	WU	Storm Water
ASBF	Asbestos-Fibrous	SBS	Sub-Surface Soil (>6")	WW	Waste Water
ASBNF	Asbestos-Non-Fibrous	SC	Cement/Concrete	XR	XRF Data
AVE	Air-Vapor Extraction, Effluent	SD	Drill Cuttings - Solid Matrix		
AX	Air Sample from Unknown Origin	SE	Sediment	**Sample Type**	
BK	Brick	SEEP	Seep	AB	Ambient Condition Blank
BS	Brackish Sediment	SF	Filter Sandpack	BIOCON	Bioassay Control Sample
CA	Cinder Ash	SJ	Sand	BS	Blank Spike
CK	Caulk	SK	Asphalt	BSD	Blank Spike Duplicate
CN	Container	SL	Sludge	EB	Equipment Blank
CR	Carbon (usually for a remediation system)	SM	Water Filter (solid material used to filter water)	EBD	Equipment Blank/Rinsate Duplicate
DF	Dust/Fallout	SN	Miscellaneous Solid Materials - Building Materials	FB	Field Blank
DR	Debris/Rubble	SO	Soil	FD	Field Duplicate
DS	Storm Drain Sediment	SP	Casing (PVC, stainless steel, cast iron, iron pipe)	FR	Field Replicate
DT	Trapped Debris	SQ	Soil/Solid Quality Control Matrix	FS	Field Spike
EF	Emissions Flux	SS	Scrapings	IDW	Purge and Rinseate Water
EW	Elutriate Water	SSD	Subsurface Sediment	LB	Lab Blank
FB	Fibers	STKG	Stack Gas	LR	Lab Replicate
FL	Forest Litter	STPM	Stripper Tower Packing Media	MB	Material Blank
GE	Soil Gas Effluent - Stack Gas (from system)	SU	Surface Soil (less than 6 inches)	MIS	Multi-Incremental Sample
GI	Soil Gas Influent (into system)	SW	Swab or Wipe	MS	Matrix Spike
GL	Headspace of Liquid Sample	SZ	Wood	N	Normal (Regular)
GQ	Gaseous or Headspace QC	TA	Animal Tissue	PE	Performance Evaluation
GR	Gravel	TP	Plant Tissue	PURGE	Purge Water Sample
GS	Soil Gas	TQ	Tissue QC	RD	Regulatory Duplicate
GSS	Soil Gas - Subslab	TX	Tissue	SB	Source Blank
GT	Grit	UNK	Unknown	SBD	Source Blank Duplicate
IC	IDW Concrete	W	Water (not groundwater, unspecified)	SCREEN	Screening Sample
IDD	IDW Solid	WA	Drill Cuttings - Aqueous Mix	SD	Matrix Spike Duplicate
IDS	IDW Soil	WB	Brackish Water	SPLIT	Sample Split
IDW	IDW Water	WC	Drilling Water (used for well construction)	SRM	Standard Reference Material
IW	Interstitial Water	WD	Well Development Water	TB	Trip Blank
LA	Aqueous Phase of Multiphase Liquid/Soil	WF	Freshwater (not groundwater)	TBD	Trip Blank Duplicate
LF	Product (floating or free)	WG	Ground Water	TBR	Trip Blank Replicate
LQ	Organic Liquid Quality Control Matrix	WH	Equipment Wash Water (i.e. water used for washing equipment)		

Instructions
Form 11-2 (Sample Collection Information)

The purpose of this form is to collate sample collection information for data entry to serve as a quick reference for sample information. Every sample that is collected should be recorded on one of these forms. The information recorded on this form must come from the field logbook, which is the official record. This form must be filled out in its entirety; if a value or piece of information is unknown or not applicable, a horizontal line should be drawn through that field.

The information on this form must be checked against the field logbook for accuracy and completeness by a field staff member before the form is submitted for data entry. Data from this form will not be entered without the signature of the individual who checked the form for accuracy and completeness.

Installation ID: Unique identifier for installation associated with the location (example: WHIDBEY)

Establishing Contract ID: Unique contract ID assigned by Division Contraction Office (example: D459559365800)

Prime Contractor Name: Name of company that established location (example: URS)

Site Name: Site name associated with the location (example: Site 11)

DO/CTO: Contract Task Order (CTO) or Delivery Order (DO) number assigned by the Navy. The format is NNNN (example: 0012)

Establishing Phase: Task Phase, Subtask Number or Annual Quarter (example: 1)

Collection Date: Date samples were collected

Location Name: Unique name used for the location (example: MW-2R)

Sample Name: Unique sample name assigned by the contractor and/or derived from historical data submittal (example: MW-1-11/02/98)

Depth Range (feet bgs): Start and end depth of sample collection, if applicable.

Collection Time: Time at which sample was collected

Sample Matrix: Matrix type code from options at the bottom of form (example: MR)

Sample Type: Sample type code from options at bottom of form (example: N)

Sampling Equipment: Sampling equipment code from options at bottom of form (example: G)

Composite: A Y/N field indicating whether or not the sample is a composite

Recorder: Signature of individual who completed form and date completed

Checker: Signature of individual who checked the data against the field logbook and date checked

SAMPLE HANDLING, STORAGE, AND SHIPPING PROCEDURES

1.0 PURPOSE

This standard operating procedure (SOP) sets forth the methods for use by U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) field personnel and their contractors engaged in handling, storing, and transporting water, soil and/or sediment samples.

2.0 PROCEDURE

2.1 HANDLING AND STORAGE

Immediately following collection, all samples will be labeled according to the procedures in SOP III-E, *Record Keeping, Sample Labeling, and Chain-of-Custody Procedures*. The lids of the containers shall not be sealed with duct tape, but may be covered with custody seals or placed directly into sealed plastic bags. The sample containers shall be placed in an insulated cooler with frozen gel packs (such as "blue ice") or ice in double, self-sealing bags. Samples should occupy the lower portion of the cooler, while the ice should occupy the upper portion. An absorbent material (e.g., proper absorbent cloth material) may be placed on the bottom of the cooler to contain liquids in case of spillage. All empty space between sample containers shall be filled with bubble wrap, Styrofoam "peanuts," or other appropriate material. Prior to shipping, glass sample containers should be wrapped on the sides, tops, and bottoms with bubble wrap or other appropriate padding and/or surrounded by packing material to prevent breakage during transport. Prior to shipment, the ice or cold packs in the coolers may require replacement to maintain samples as close to 4°C as possible during transport of the samples to the analytical laboratory. Samples shall be shipped as soon as possible to allow the laboratory to meet holding times for analyses. The procedures for maintaining sample temperatures at 4°C, pertains to all water, soil, and sediment field samples.

2.2 SHIPPING

All appropriate U.S. Department of Transportation (DOT) regulations (e.g., 49 Code of Federal Regulations (CFR), Parts 171-179) shall be followed in shipment of air, soil, water, and other samples.

2.2.1 Hazardous Materials Shipment

Field personnel must state whether any sample is suspected to be a hazardous material. A sample should be assumed to be hazardous unless enough evidence exists to indicate it is nonhazardous. If not suspected to be hazardous, shipments may be made as described in the Section 2.2.2 for non-hazardous materials. If hazardous, the procedures summarized below must be followed.

Any substance or material that is capable of posing an unreasonable risk to life, health, or property when transported is classified as hazardous. Hazardous materials identification should be performed by checking the list of dangerous goods for that particular mode of transportation. If not on that list, materials can be classified by checking the Hazardous Materials Table (49 CFR 172.102 including Appendix A) or by determining if the material meets the definition of any hazard class or division (49 CFR Part 173), as listed in Attachment III-G-2.

All persons offering for shipment any hazardous material must be properly trained in the appropriate regulations, as required by HM-126F, Training for Safe Transportation of Hazardous Materials. The training covers loading, unloading, handling, storing, and transporting of hazardous materials, as well as emergency preparedness in the case of accidents. Carriers such as commercial couriers must also be trained.

When shipping hazardous materials, including bulk chemicals or samples suspected of being hazardous, the proper shipping papers (49 CFR 172 Subpart C), package marking (49 CFR 172 Subpart D), labeling (49 CFR 172 Subpart E), placarding (49 CFR 172 Subpart F, generally for carriers), and packaging must be used. Attachment III-G-1 shows an example of proper package markings. A copy of 49 CFR should be referred to each time a hazardous material or potentially hazardous samples are shipped.

According to Section 2.7 of the International Air Transport Association (IATA) Dangerous Goods Regulations publication, very small quantities of certain dangerous goods may be transported without certain marking and documentation requirements as described in 49 CFR Part 172. However, other labeling and packing requirements must still be followed. Attachment III-G-2 shows the volume or weight for different classes of substances. A "Dangerous Goods in Excepted Quantities" label must be completed and attached to the associated shipping cooler (Attachment III-G-3). Certain dangerous goods are not allowed on certain airlines in any quantity.

As stated in item 4 of Attachment III-G-4, the Hazardous Materials Regulations do not apply to hydrochloric acid (HCl), nitric acid (HNO_3), sulfuric acid (H_2SO_4), and sodium hydroxide (NaOH) added to water samples if their pH or percentages by weight criteria are met. These samples may be shipped as non-hazardous materials as discussed below.

2.2.2 Nonhazardous Materials Shipment

If the samples are suspected to be nonhazardous, based on previous site sample results, field screening results, or visual observations, if applicable, then samples may be shipped as nonhazardous.

When a cooler is ready for shipment to the laboratory, copies of the chain-of-custody form shall be placed inside a sealed plastic bag and placed inside of an insulated cooler. The coolers will then be sealed with waterproof tape and labeled "Fragile," "This-End-Up" (or directional arrows pointing up), or other appropriate notices. Custody seals will be placed on the coolers as discussed in SOP III-E, *Record Keeping, Sample Labeling, and Chain-of-Custody Procedures*.

2.2.3 Shipments from Outside the Continental United States

Shipment of sample coolers to the U.S. from locations outside the continental U.S. is controlled by the USDA and is subject to their inspection and regulation. Documentation is required to prove that the analytical laboratory receiving samples is certified. The laboratory must have certification by USDA to receive and properly dispose of soil; this is called a "USDA Soil Import Permit." In addition, all sample coolers must be inspected by a USDA representative, affixed with a label indicating that the coolers contain environmental samples, and shipping forms stamped by the USDA inspector prior to shipment. In addition, samples shipped from U.S. territorial possessions or foreign countries, must be cleared by the U.S. Customs Service upon entry into the United States. As long as the commercial invoice is properly completed (see below), shipments typically pass through U.S. Customs without the need to open coolers for inspection.

Completion and use of proper paperwork will, in most cases, minimize or eliminate the need of the USDA and U.S. Customs to inspect the contents. Attachment III-G-5 shows an example of how paperwork may be placed on the outside of coolers for nonhazardous materials. For hazardous materials, refer to Section 2.2.1.

In summary, the paperwork listed below should be taped to the outside of the coolers to assist sample shipments. If a shipment is made up of multiple pieces (e.g., more than one cooler), the paperwork need be attached only to one cooler, provided that the courier agrees. All other coolers in the shipment need only be taped and have address and chain-of-custody seals affixed.

1. **Courier Shipping Form & Commercial Invoice** - See Attachments III-G-6, III-G-7, and III-G-8 for examples of the information to be included on these forms. Both forms should be placed inside a clear plastic adhesive-backed pouch, which adheres to the package (typically supplied by the courier) and placed on the cooler lid as shown in Attachment 5.

2. **Soil Import Permit and USDA Letter** (soil only) - See Attachments III-G-9 and III-G-10 for examples. The laboratory shall supply these documents prior to mobilization. The USDA in Hawaii often <u>does</u> stop shipments of soil without these documents. The 2" x 2" USDA label (described below), the USDA letter, and soil impact permit should be stapled together and placed inside a clear plastic pouch. Clear plastic and adhesive-backed pouches are typically supplied by the mailing courier.

3. The analytical laboratory should supply the Soil Import Permit. Although original labels are preferred, copies of this label, which are cut out to the 2" x 2" dimensions, are acceptable. Placing one label (as shown in Attachment III-G-5) covered with clear packing tape and one stapled to the actual permit is suggested.

4. The USDA does not control water samples, thus the requirements for soils listed above do not apply.

5. **Custody Seals**. Task Order personnel must sign and date custody seals. At least two seals should be placed in such a manner that they stick to both the cooler lid and body. The seals shall be

placed so the cooler/container cannot be opened without breaking the seal. The custody seals are then covered with clear packing tape. This prevents the seal from coming loose and enables detection of tampering.

6. **Address Label**. A label stating the destination (the sending and laboratory, company, or location address) should be affixed to each cooler. The label should also include both telephone numbers.
7. **Special Requirements for Hazardous Materials -** see Section 2.2.1.

Upon receipt of sample coolers at the laboratory, the sample custodian shall inspect the sample containers as discussed in SOP III-E, *Record Keeping, Sample Labeling, and Chain-of-Custody Procedures*. The samples shall then be immediately extracted and/or analyzed, or stored in a refrigerated storage area until they are removed for extraction and/or analysis. Whenever the samples are not being extracted or analyzed, they shall be returned to refrigerated storage.

3.0 DOCUMENTATION

Records shall be maintained as required by implementing these procedures.

4.0 REFERENCES

HM-126F, Training for Safe Transportation of Hazardous Materials

SOP III-E, Record Keeping, Sample Labeling, and Chain-of-Custody Procedures

5.0 ATTACHMENTS

Attachment III-G-1 Example Package Marking

Attachment III-G-2 Packing Groups

Attachment III-G-3 Label for Dangerous Goods in Excepted Quantities

Attachment III-G-4 SW-846 Preservative Exception

Attachment III-G-5 Sample Cooler Marking Figure

Attachment III-G-6 Example Courier Form

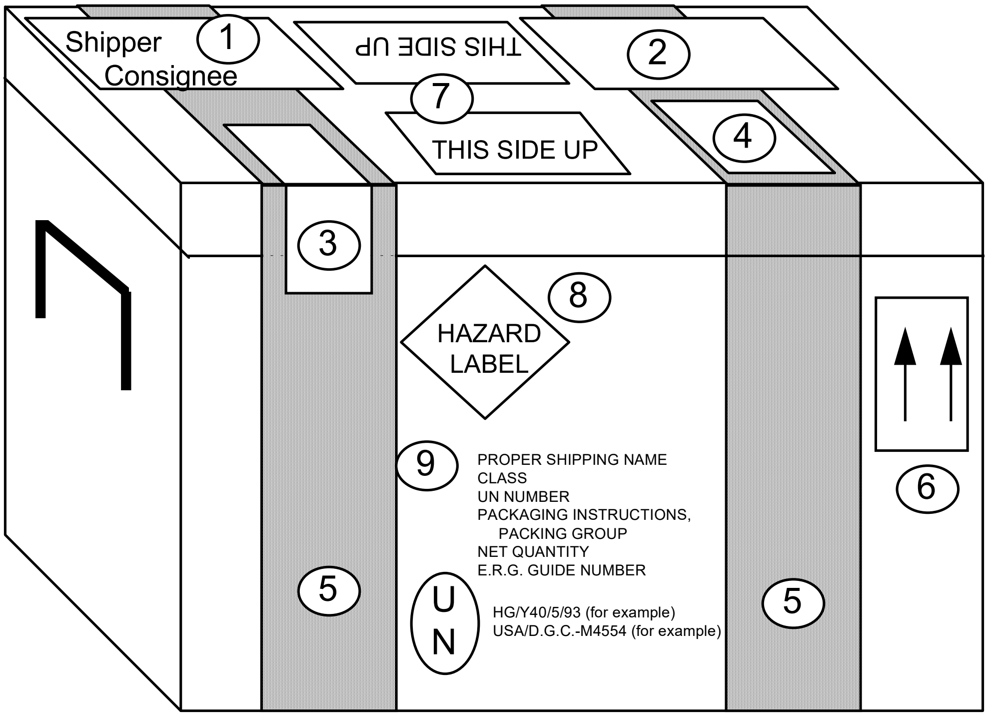
Attachment III-G-7 Commercial Invoice - Soil

Attachment III-G-8 Commercial Invoice - Water

Attachment III-G-9 Soil Import Permit

Attachment III-G-10 Soil Samples Restricted Entry Labels

Attachment III-G-1
Example Hazardous Material Package Marking



① **AIR BILL/COMMERCIAL INVOICE**

② **USDA PERMIT (Letter to Laboratory from USDA)**

③ **CUSTODY SEAL**

④ **USDA 2" X 2" SOIL IMPORT PERMIT**

⑤ **WATERPROOF STRAPPING TAPE**

⑥ **DIRECTION ARROWS STICKER - TWO REQUIRED**

⑦ **THIS SIDE UP STICKERS**

⑧ **HAZARD LABEL**

⑨ **HAZARDOUS MATERIAL INFORMATION**

⑩ **PACKAGE SPECIFICATIONS**

Attachment III-G-2
Packing Groups

Packing Group of the Substance	Packing Group I		Packing Group II		Packing Group III	
CLASS or DIVISION of PRIMARY or SUBSIDIARY RISK	Packagings		Packagings		Packagings	
	Inner	Outer	Inner	Outer	Inner	Outer
1: Explosives	-------------------- Forbidden (Note A) -------------------					
2.1: Flammable Gas	-------------------- Forbidden (Note B) -------------------					
2.2: Non-Flammable, non-toxic gas	------------------ See Notes A and B -----------------					
2.3: Toxic gas	-------------------- Forbidden (Note A) -------------------					
3. Flammable liquid	30 mL	300 mL	30 mL	500 mL	30 mL	1 L
4.1 Self-reactive substances	Forbidden		Forbidden		Forbidden	
4.1: Other flammable solids	Forbidden		30 g	500 g	30 g	1 kg
4.2: Pyrophoric substances	Forbidden		Not Applicable		Not Applicable	
4.2 Spontaneously combustible substances	Not Applicable		30 g	500 g	30 g	1 kg
4.3: Water reactive substances	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
5.1: Oxidizers	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
5.2: Organic peroxides (Note C)	See Note A		30 g or 30 mL	500 g or 250 mL	Not Applicable	
6.1: Poisons - Inhalation toxicity	Forbidden		1 g or 1 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
6.1: Poisons - oral toxicity	1 g or 1 mL	300 g or 300 mL	1 g or 1 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
6.1: Poisons - dermal toxicity	1 g or 1 mL	300 g or 300 mL	1 g or 1 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
6.2: Infectious substances	-------------------- Forbidden (Note A) -------------------					
7: Radioactive material (Note D)	-------------------- Forbidden (Note A) -------------------					
8: Corrosive materials	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L
9: Magnetized materials	-------------------- Forbidden (Note A) -------------------					
9: Other miscellaneous materials (Note E)	Forbidden		30 g or 30 mL	500 g or 500 mL	30 g or 30 mL	1 kg or 1 L

Note A: Packing groups are not used for this class or division.

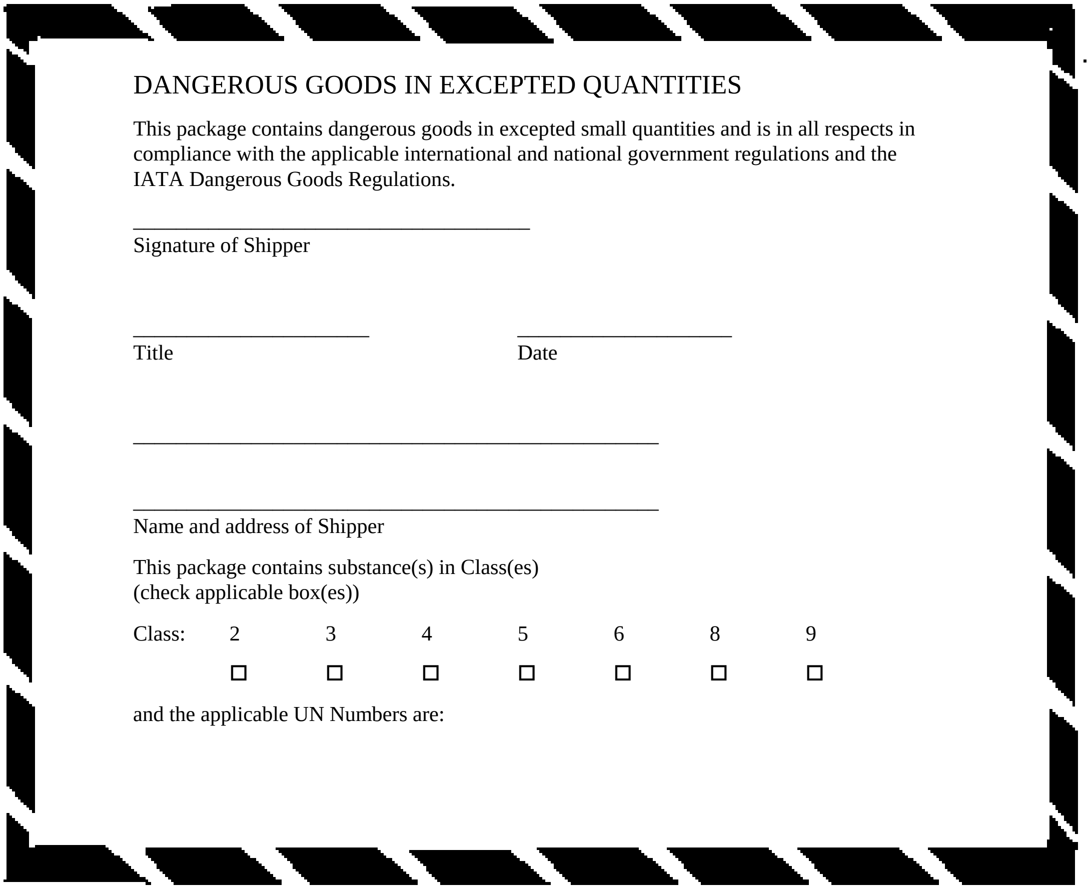
Note B: For inner packagings, the quantity contained in receptacle with a water capacity of 30 mL. For outer packagings, the sum of the water capacities of all the inner packagings contained must not exceed 1 L.

Note C: Applies only to Organic Peroxides when contained in a chemical kit, first aid kit or polyester resin kit.

Note D: See 6.1.4.1, 6.1.4.2 and 6.2.1.1 through 6.2.1.7, radioactive material in excepted packages.

Note E: For substances in Class 9 for which no packing group is indicated in the List of Dangerous Goods, Packing Group II quantities must be used.

Attachment III-G-3
Label For Dangerous Goods In Excepted Quantities



DANGEROUS GOODS IN EXCEPTED QUANTITIES

This package contains dangerous goods in excepted small quantities and is in all respects in compliance with the applicable international and national government regulations and the IATA Dangerous Goods Regulations.

____
Signature of Shipper

______________________ ____________________
Title Date

____

____
Name and address of Shipper

This package contains substance(s) in Class(es)
(check applicable box(es))

Class:	2	3	4	5	6	8	9
	☐	☐	☐	☐	☐	☐	☐

and the applicable UN Numbers are:

ATTACHMENT III-G-4
Preservative Exception

Measurement	Vol. Req. (mL)	Container[2]	Preservative [3,4]	Holding Time[5]
MBAS	250	P,G	Cool, 4ºC	48 Hours
NTA	50	P,G	Cool, 4ºC	24 Hours

1. More specific instructions for preservation and sampling are found with each procedure as detailed in this manual. A general discussion on sampling water and industrial wastewater may be found in ASTM, Part 31, p. 72-82 (1976) Method D-3370.

2. Plastic (P) or Glass (G). For metals, polyethylene with a polypropylene cap (no liner) is preferred.

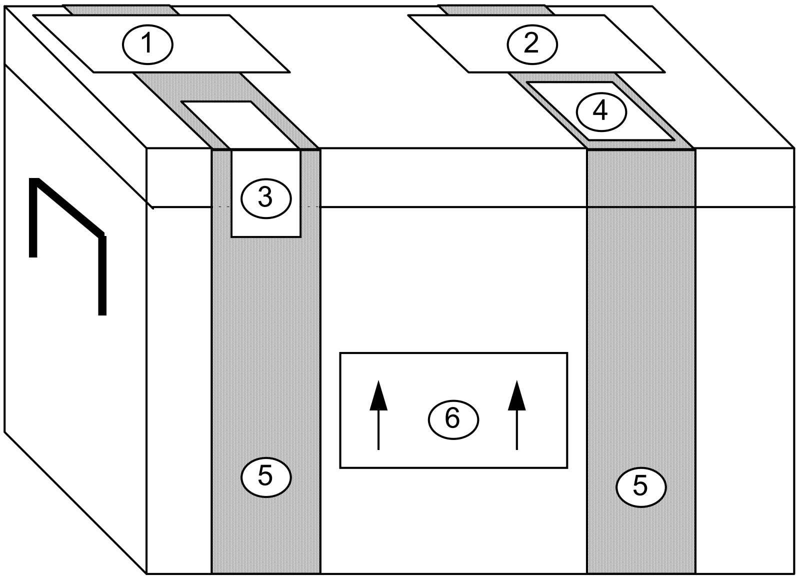
3. Sample preservation should be performed immediately upon sample collection. For composite samples each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4ºC until compositing and sample splitting is completed.

4. When any sample is to be shipped by common carrier or sent through the United States Mail, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. for the preservation requirements of Table 1, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentration of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or grater); Sodium hydroxide ($NaOH$) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).

5. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of sample under study are stable for the longer time, and has received a variance from the Regional Administrator. Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.

6. Should only be used in the presence of residual chlorine.

Attachment III-G-5
Non-Hazardous Material Cooler Marking Figure For Shipment From Outside the Continental United States



① **AIR BILL/COMMERCIAL INVOICE**
② **USDA PERMIT (Letter to Laboratory from USDA)**
③ **CUSTODY SEAL**
④ **USDA 2" X 2" SOIL IMPORT PERMIT**
⑤ **WATERPROOF STRAPPING TAPE**
⑥ **DIRECTION ARROWS STICKER - TWO REQUIRED**

Attachment III-G-6
Example Courier Form

FedEx USA Airbill FedEx Tracking Number 801704855619 0200 Form I.D. No.

SPL11

Sender's Copy

1 From (please print and press hard)

Date ______ Sender's FedEx Account Number [redacted] Account Number

Sender's Name Joe Smith Phone (808) 545-2462

Company OGDEN ENVIRONMENTAL/CRC ACCT

Address 680 IWILEI RD STE 660 Dept./Floor/Suite/Room

City HONOLULU State HI ZIP 96817

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name Sample Receipt Phone ( ) Lab Phone #

Company Lab Name

☐ Check here if residence (Extra charge applies for FedEx Express Saver)

Address Lab Address
(To "HOLD" at FedEx location, print FedEx address here) (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept./Floor/Suite/Room

City ______ State ______ ZIP ______

For HOLD at FedEx Location check here
☐ Hold Weekday (Not available with FedEx First Overnight)
☐ Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

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Call 1·800·Go·FedEx (800)463-3339

The World On Time

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.
☐ FedEx Priority Overnight (Next business morning)
☐ FedEx Standard Overnight (Next business afternoon)
☐ FedEx 2Day* (Second business day)
☐ FedEx Express Saver* (Third business day)
☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

* FedEx Letter Rate not available. Minimum charge: One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.
☐ FedEx Overnight Freight (Next business day)
☐ FedEx 2Day Freight (Second business day)
☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak ☐ FedEx Box ☐ FedEx Tube ☐ Other Pkg.
Declared value limit $500.

6 Special Handling
Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)
☐ Dry Ice
Dry Ice, 9, UN 1845 III ______ x ______ kg. 904
(Dangerous Goods Shipper's Declaration not required)
CA ☐ Cargo Aircraft Only

7 Payment
Bill to: ☐ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check
(Enter FedEx account no. or Credit Card no. below)

FedEx Account No. ______
Credit Card No. ______ Exp. Date ______

Total Packages	Total Weight	Total Declared Value*	Total Charges
		$ .00	$

*When declaring a value higher than $100 per shipment, you pay an additional charge. See **SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY** section for further information.

8 Release Signature *Sign to authorize delivery without obtaining signature.*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

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Rev. Date 5/97
Part #150364
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003520091 4

RETAIN THIS COPY FOR YOUR RECORDS

Attachment III-G-7
Commercial Invoice - Soil

DATE OF EXPORTATION 1/1/94	EXPORT REFERENCES (i.e., order no., invoice no., etc.) <CTO #>
SHIPPER/EXPORTER (complete name and address) Joe Smith Ogden c/o <hotel name> <hotel address>	CONSIGNEE Sample Receipt <Lab Name> <Lab Address>
COUNTRY OF EXPORT Guam, USA	IMPORTER - IF OTHER THAN CONSIGNEE
COUNTRY OF ORIGIN OF GOODS Guam, USA	
COUNTRY OF ULTIMATE DESTINATION USA	

INTERNATIONAL
AIR WAYBILL NO.

(NOTE: All shipments must be accompanied by a Federal Express International Air Waybill)

MARKS/ NOS	NO. OF PKGS	TYPE OF PACKAGING	FULL DESCRIPTION OF GOODS	QTY	UNIT OF MEASURE	WEIGHT	UNIT VALUE	TOTAL VALUE
	3	coolers	Soil samples for laboratory analysis only				$1.00	$3.00
	TOTAL NO. OF PKGS.					TOTAL WEIGHT		TOTAL INVOICE VALUE
	3							$3.00
								Check one ☐ F.O.B. ☐ C&F ☐ C.I.F.

THESE COMMODITIES ARE LICENSED FOR THE ULTIMATE DESTINATION SHOWN.

DIVERSION CONTRARY TO UNITED STATES LAW IS PROHIBITED.

I DECLARE ALL THE INFORMATION CONTAINED IN THIS INVOICE TO BE TRUE AND CORRECT

SIGNATURE OF SHIPPER/EXPORTER (Type name and title and sign)

Joe Smith, Ogden	Joe Smith	1/1/94
Name/Title	Signature	Date

ATTACHMENT III-G-8
Commercial Invoice - Water

DATE OF EXPORTATION 1/1/94	EXPORT REFERENCES (i.e., order no., invoice no., etc.) <CTO #>
SHIPPER/EXPORTER (complete name and address) Joe Smith Ogden c/o <hotel name> <hotel address>	CONSIGNEE Sample Receipt <Lab Name> <Lab Address>
COUNTRY OF EXPORT Guam, USA	IMPORTER - IF OTHER THAN CONSIGNEE
COUNTRY OF ORIGIN OF GOODS Guam, USA	
COUNTRY OF ULTIMATE DESTINATION USA	

INTERNATIONAL AIR WAYBILL NO. (NOTE: All shipments must be accompanied by a Federal Express International Air Waybill)

MARKS/ NOS	NO. OF PKGS	TYPE OF PACKAGING	FULL DESCRIPTION OF GOODS	QTY	UNIT OF MEASURE	WEIGHT	UNIT VALUE	TOTAL VALUE
	3	coolers	Water samples for laboratory analysis only				$1.00	$3.00
	TOTAL NO. OF PKGS.					TOTAL WEIGHT		TOTAL INVOICE VALUE
	3							$3.00
								Check one ☐ F.O.B. ☐ C&F ☐ C.I.F.

THESE COMMODITIES ARE LICENSED FOR THE ULTIMATE DESTINATION SHOWN.

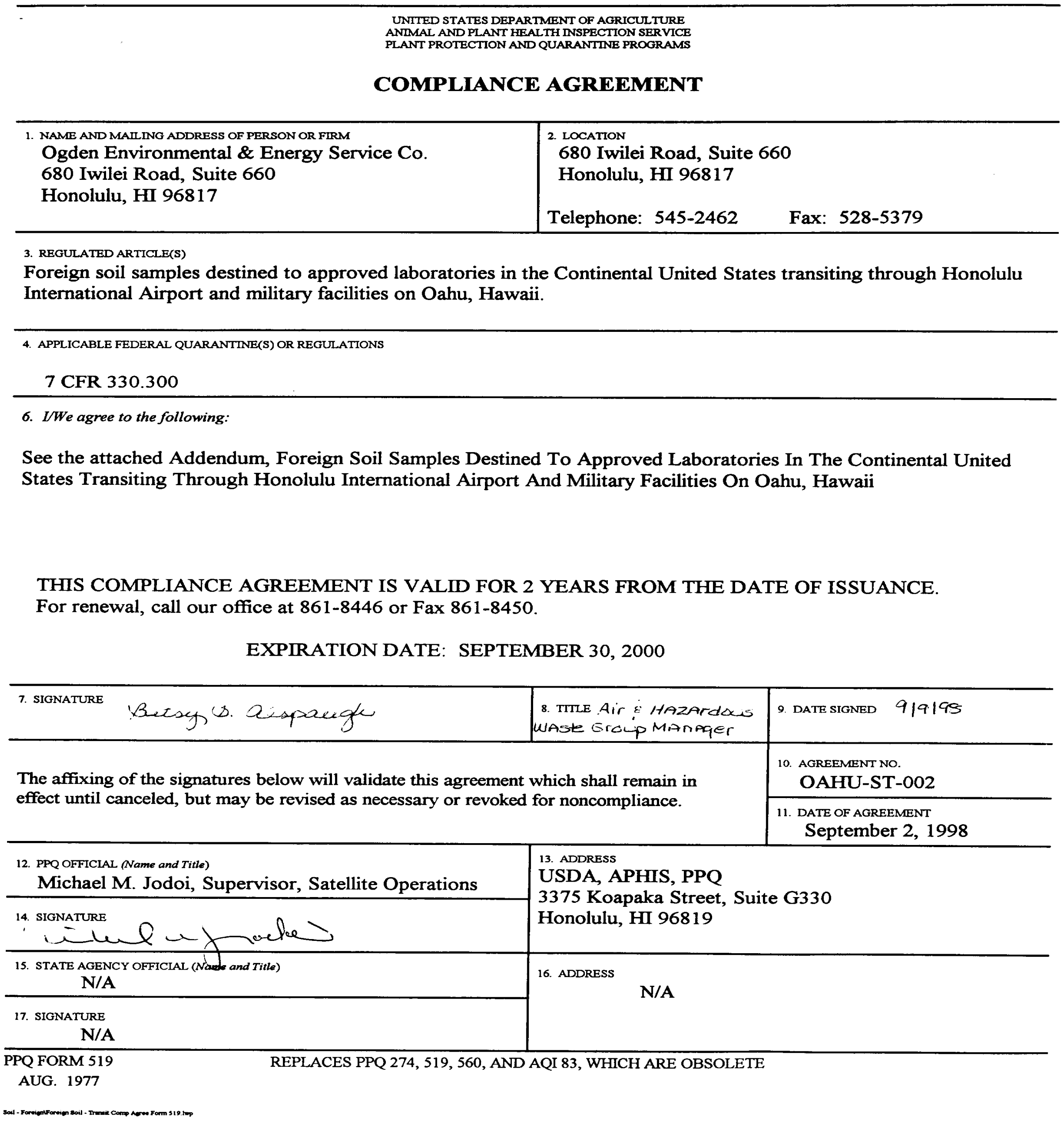
DIVERSION CONTRARY TO UNITED STATES LAW IS PROHIBITED.

I DECLARE ALL THE INFORMATION CONTAINED IN THIS INVOICE TO BE TRUE AND CORRECT

SIGNATURE OF SHIPPER/EXPORTER (Type name and title and sign)

Name/Title	Signature	Date
Joe Smith, Ogden	Joe Smith	1/1/94

Attachment III-G-9
Soil Import Permit



UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE PROGRAMS

COMPLIANCE AGREEMENT

1. NAME AND MAILING ADDRESS OF PERSON OR FIRM
Ogden Environmental & Energy Service Co.
680 Iwilei Road, Suite 660
Honolulu, HI 96817

2. LOCATION
680 Iwilei Road, Suite 660
Honolulu, HI 96817

Telephone: 545-2462 Fax: 528-5379

3. REGULATED ARTICLE(S)
Foreign soil samples destined to approved laboratories in the Continental United States transiting through Honolulu International Airport and military facilities on Oahu, Hawaii.

4. APPLICABLE FEDERAL QUARANTINE(S) OR REGULATIONS
7 CFR 330.300

6. *I/We agree to the following:*

See the attached Addendum, Foreign Soil Samples Destined To Approved Laboratories In The Continental United States Transiting Through Honolulu International Airport And Military Facilities On Oahu, Hawaii

THIS COMPLIANCE AGREEMENT IS VALID FOR 2 YEARS FROM THE DATE OF ISSUANCE.
For renewal, call our office at 861-8446 or Fax 861-8450.

EXPIRATION DATE: SEPTEMBER 30, 2000

7. SIGNATURE Betsy D. Aispaugh
8. TITLE Air & Hazardous Waste Group Manager
9. DATE SIGNED 9/9/98

The affixing of the signatures below will validate this agreement which shall remain in effect until canceled, but may be revised as necessary or revoked for noncompliance.

10. AGREEMENT NO. OAHU-ST-002
11. DATE OF AGREEMENT September 2, 1998

12. PPQ OFFICIAL *(Name and Title)*
Michael M. Jodoi, Supervisor, Satellite Operations

13. ADDRESS
USDA, APHIS, PPQ
3375 Koapaka Street, Suite G330
Honolulu, HI 96819

14. SIGNATURE

15. STATE AGENCY OFFICIAL *(Name and Title)*
N/A

16. ADDRESS
N/A

17. SIGNATURE
N/A

PPQ FORM 519 REPLACES PPQ 274, 519, 560, AND AQI 83, WHICH ARE OBSOLETE
AUG. 1977

Soil - Foreign\Foreign Soil - Transit Comp Agree Form 519.hwp

Attachment III-G-10
Soil Samples Restricted Entry Labels

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE
HYATTSVILLE, MARYLAND 20782
soil samples
restricted entry

The material contained in this package is imported under authority of the Federal Plant Pest Act of May 23, 1957.

For release without treatment if addressee is currently listed as approved by Plant Protection and Quarantine.

PPQ FORM 550 Edition of 12/77 may be used
(JAN 83)

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE
HYATTSVILLE, MARYLAND 20782
soil samples
restricted entry

The material contained in this package is imported under authority of the Federal Plant Pest Act of May 23, 1957.

For release without treatment if addressee is currently listed as approved by Plant Protection and Quarantine.

PPQ FORM 550 Edition of 12/77 may be used
(JAN 83)

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE
HYATTSVILLE, MARYLAND 20782
soil samples
restricted entry

The material contained in this package is imported under authority of the Federal Plant Pest Act of May 23, 1957.

For release without treatment if addressee is currently listed as approved by Plant Protection and Quarantine.

PPQ FORM 550 Edition of 12/77 may be used
(JAN 83)

EQUIPMENT DECONTAMINATION

1.0 PURPOSE

The standard operating procedure (SOP) describes general methods of equipment decontamination (decon) for use by U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) field personnel and their contractors during field sampling activities. Some sites may require additional steps (e.g. nitric rinses for metals, hexane for chlorinated pesticides) to insure equipment is properly deconned. These should be identified and addressed in the Work Plans and/or the Quality Assurance Project Plans (QAPPs)

2.0 PROCEDURES

Decontamination of equipment is necessary to prevent cross-contamination and to maintain the highest integrity possible in collected samples. Planning a decontamination program should include consideration of the following factors:

- The location where the decon procedures will be conducted
- The types of equipment requiring decon
- The frequency of equipment decontamination
- The cleaning technique and types of cleaning solutions appropriate to the contaminants of concern
- The method for containing the residual contaminants and wash water from the deconning process
- The use of a quality control measure to determine the effectiveness of the decontamination procedure (e.g. equipment rinsate samples)

This subsection describes standards for decontamination, including the techniques to be used, frequency of decontamination, cleaning solutions, and effectiveness.

2.1 DECONTAMINATION AREA

An appropriate location for the decontamination area at a site shall be selected on the basis of the ability to control access to the area, control residual material removed from equipment, the need to store dirty and clean equipment, and the ability to restrict access to the area being investigated. The decontamination area shall be located an adequate distance away and upwind from potential contaminant sources to avoid contamination of clean equipment.

2.2 TYPES OF EQUIPMENT

Examples of drilling equipment that must be deconned includes drill bits, auger sections, split spoon samplers, and hand tools. Decontamination of monitoring well development and ground-water sampling equipment includes submersible pumps, non-disposable bailers, interface probes, water level meters, bladder pumps, airlift pumps, and lysimeters. Other sampling equipment that may require decontamination includes, but is not limited to, hand trowels, hand augers, slide hammer samplers, shovels, stainless steel spoons and bowls, soil sample liners and caps, wipe sampling templates, COLIWASA samplers, and dippers. Equipment with a porous surface, such as rope, cloth hoses, and wooden blocks, cannot be thoroughly decontaminated and should be properly disposed of after one use.

2.3 FREQUENCY OF EQUIPMENT DECONTAMINATION

Down-hole drilling equipment and equipment used in monitoring well development and purging shall be decontaminated prior to initial use and between each borehole or well. However, down hole drilling equipment may require more frequent cleaning to prevent cross-contamination between vertical zones within a single borehole. When drilling through a shallow contaminated zone and installing a surface casing to seal off the contaminated zone, the drilling tools shall be decontaminated prior to drilling deeper. Groundwater sampling should be initiated by sampling ground water from the monitoring well where the least contamination is suspected. This is more important when not using disposable equipment. All groundwater, surface water, and soil sampling devices shall be decontaminated prior to initial use and between collection of each sample to prevent the possible introduction of contaminants into successive samples.

2.4 CLEANING SOLUTIONS AND TECHNIQUES

Decontamination can be accomplished using a variety of techniques and fluids. The preferred method of decontaminating major equipment such as drill bits, augers, drill string, pump drop-pipe, etc., is steam cleaning. Steam cleaning is accomplished using a portable, high-pressure steam cleaner equipped with a pressure hose and fittings. For this method, equipment shall be thoroughly steam washed and rinsed with potable tap water to remove particulates and contaminants.

A rinse decontamination procedure is acceptable for equipment such as bailers, water level meters, new and re-used soil sample liners, and hand tools. The decontamination procedure shall consist of the following: (1) wash with a non-phosphate detergent (Citrinox®, Liquinox®, or other suitable phosphate free detergent) and potable water solution, (2) rinse with potable water, and (3) rinses with deionized or distilled water. Equipment shall be disassembled as much as is practical, prior to cleaning. An initial gross wash scrub down and quick rinse should be completed at the beginning of the process if equipment is heavily soiled. After decontamination, care needs to be taken that the cleaned equipment does not become contaminated. This may require wrapping items in foil or plastic and storing the equipment in a specified “clean” area.

Decontaminating submersible pumps requires additional effort because internal surfaces become contaminated during usage. The pumps shall be decontaminated by circulating fluids through the pump while it is operating. This circulation can be done using a clean 4-inch or greater diameter pipe equipped with an end cap. The pipe shall be filled with enough decon fluid to submerge the pump, the pump placed within the capped pipe, and the pump operated while circulating the fluids within the pipe. The decontamination sequence shall include (1) detergent and potable water, (2) potable water rinse, and (3) deionized or distilled water rinse. The decontamination fluids shall be changed after each cycle. Changing of the fluids may include dumping of the detergent water, mixing detergent in the potable water rinse, using the deionized water as the potable rinse and renewing the distilled/deionized water. All decon water shall be disposed of as outlined in the field work plans.

Decontamination solvent(s) to be used during field activities will be specified in Project Work Plans or QAPPs. If solvents are used, sufficient time must be allowed to insure the solvent has evaporated from the equipment prior to reuse.

Equipment used for measuring field parameters such as pH, temperature, specific conductivity, and turbidity shall be rinsed with deionized or distilled water. New, unused soil sample liners and caps will be cleaned using the three step process, outlined above, to remove any dirt or cutting oils that may be on them prior to use.

2.5 CONTAINMENT OF RESIDUAL CONTAMINANTS AND CLEANING SOLUTIONS

Decontamination program for equipment exposed to potentially hazardous materials requires a provision for catchment and disposal of the contaminated material, cleaning solution, and wash water. This may require setting up a containment area with a system for pumping the water generated decontamination water into proper containers.

Clean equipment should be stored in a separate location to prevent recontamination. Decontamination fluids contained within the bermed area shall be collected and disposed of as outlined in the field sampling plan.

Containment of fluids from the decontamination of lighter-weight drilling equipment and hand-held sampling devices shall be accomplished using wash buckets or tubs. The decontamination fluids shall be collected and disposed of as outlined in the field sampling plan.

2.6 EFFECTIVENESS OF DECONTAMINATION PROCEDURES

A decontamination program must incorporate quality control measures to determine the effectiveness of cleaning methods. Quality control measures typically include collection of equipment rinsate samples or wipe testing. Equipment rinsates consist of analyte-free water that has been poured over or through the sample collection equipment after its final decontamination rinse. Wipe testing is performed by wiping a cloth over the surface of the equipment after cleaning. Further descriptions of these samples and their required frequency of collection are provided in SOP III-B, *Field QC Samples (Water, Soil)*. These quality control measures provide "after-the fact" information that may be useful in determining whether or not cleaning methods were effective in removing the contaminants of concern.

3.0 DOCUMENTATION

The decontamination process shall be recorded in the field logbook.

4.0 REFERENCES

SOP III-B, *Field QC Samples (Water, Soil).*

5.0 ATTACHMENTS

None.

EQUIPMENT CALIBRATION, OPERATION, AND MAINTENANCE

1.0 PURPOSE

This standard operating procedure (SOP) describes the activities and responsibilities of the U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) personnel pertaining to the operating, calibration, and maintenance of equipment used to collect environmental data. Reliable measurements of data required by the field sampling plan are necessary because the information recorded may be the basis for development of remedial action and responses.

2.0 PROCEDURES

2.1 EQUIPMENT CALIBRATION

All water quality monitoring equipment will be calibrated and adjusted to operate within the manufacturers' specifications. Water quality instruments and equipment that require calibration are to be calibrated to specifications prior to field use. In addition, a one-point calibration check is made at midday and at intervals outlined in the field sampling plan. A final check is conducted at the end of each field day. This is not a recalibration of the meter but a check of the calibration to ensure the continued accuracy of the meter. All calibration information shall be recorded in the project logbook.

Special attention shall be paid to instruments that may be affected by the change in the ambient temperature or humidity. Calibration checks should also be performed when sampling conditions change significantly, a change of sample matrix, and/or readings are unstable or there is a change of parameter measurements that appear unusual.

2.2 EQUIPMENT MAINTENANCE

All field monitoring equipment, field sampling equipment, and accessories are to be maintained in accordance with the manufacturer's recommendations and specifications and/or established field practices. All maintenance will be performed by qualified personnel and documented in the field logbook.

Equipment requiring battery charging shall be charged as recommended by the manufacturer. Backup batteries for meters requiring them shall be included as part of the meters accessories. Care must be taken to protect meters from adverse elements. This may involve placing the meter in a large plastic bag to shield it from the weather.

3.0 DOCUMENTATION

All field equipment calibration, maintenance, and operation information shall be recorded within the field logbook. This is to document that appropriate procedures have been followed and to track the equipment operation. All entries in the field logbook must be written accurately and legibly as outlined in the SOP III-D, *Logbooks*.

Logbook entries shall contain, but are not necessarily limited to, the following:

- Equipment model and serial numbers
- Date and time of calibration or maintenance performed
- Calibration standard used
- Calibration lot number and expiration date if listed on bottle
- Calibration procedure used if there are multiple options
- Calibration and calibration check readings including units used
- Problems and solutions regarding use, calibration or maintenance of the equipment
- And other pertinent information

4.0 REFERENCES

SOP III-D, *Logbooks*

5.0 ATTACHMENTS

None.

Standard Operating Procedure No. 057
for
Incremental Sampling Methodology

Prepared by

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

Revision 1
March 2020

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PROJECT-SPECIFIC VARIANCE FORM

This form is to be completed to indicate if there are any client-, project-, or site-specific variances to this Standard Operating Procedure (SOP) (**also check Box A**), or if this SOP is being used with no changes (**only check Box B**).

☐ **A. Variances required; cite section(s) of the SOP to which there is a variance**

☐ **B. No variances**

SOP No. 057	
SOP Section	**Variance**

Project Manager (Name)

Project Manager (Signature) Date

CONTENTS

Page

DOCUMENT REVISION HISTORY

ORIGINAL (MASTER) DOCUMENT REVISION HISTORY				
Revision Number	**Revision Date**	**Revision Summary**	**Revised By**	**Reviewed By**
1	March 2020	Update with new applications/guidance	Daniel Hinckley, Brenda Nuding	Matthew Bowman

1. INTRODUCTION

1.1 SCOPE AND APPLICATION

The incremental sampling methodology (ISM) technique, also known as the multi-incremental (MI) sampling approach, offers reduced sample variability and improved sample representativeness for surface and subsurface soils as well as sediments than traditional discrete or composite sampling approaches. This standard operating procedure (SOP) presents a brief summary of the background of the ISM as well as scope, application, general concepts, equipment and materials, procedures to be followed for implementation, and precautions. The purpose of this SOP is to delineate protocols for the application of ISM field sampling of surface soil. The procedure, which can be adapted to allow for MI sampling in other environments (i.e., in an excavation trench or spoil piles), has been adapted from U.S. Army Corps of Engineers (2009) and Interstate Technology and Regulatory Council (ITRC) 2012 sampling guidance.

ITRC has published a comprehensive guidance for ISM (ITRC 2012). This document presents details about the statistical theories on which it is based, how to establish and sample decision units (DUs), field and laboratory processing and subsampling of ISM samples, and other related topics. U.S. Environmental Protection Agency's sample design software Visual Sampling Plan, available at https://vsp.pnnl.gov/ at no cost, includes a module that will model the appropriate number of increments (aliquots) to be collected within each DU and will design a sample plan that will achieve the data quality objectives of a project.

The suitability of ISM should be evaluated on a case-by case basis when planning documents are prepared for an environmental investigation to ensure that the resulting analytical data are appropriate to make the decisions required by the project. This evaluation process considers:

1. Planning elements based on the decisions to be made for each potentially complete pathway (based on the conceptual site model), including contaminant distribution, potential hotspot size, future land use scenarios, contaminant fate and transport, regulatory acceptance, etc.

2. Sample preparation procedures to be employed by the analytical laboratory (limitations and impacts on the analytical data due to the various preparation methods that can be employed and the nature of the contaminant to be analyzed).

3. Data evaluation requirements (i.e., the data needing to meet a certain level of confidence). In addition to technical considerations, stakeholders' input should be folded into the planning stages. Consequently, specific field requirements may be outlined in the planning documents for the sampling program implementation to supplement this SOP.

This SOP focuses on the actual collection of ISM samples, not project planning or data evaluation to follow, and assumes that successful project planning and scoping have been performed, documented, and agreed to by stakeholders. Because DUs are defined so that the exposure point concentration value (estimate of the mean) obtained is relevant to an explicitly articulated end use of the data, it is imperative that **changes to the DUs or sampling strategy deemed necessary by actual field conditions unanticipated at the time the sampling plan was designed should be made by the project technical lead rather than by field personnel.** This way, field deviations from the approved plan during sample collection will not negatively impact the adequacy of the data for the planned purpose.

1.2 GLOSSARY OF TERMS

1.2.1 Decision Units

A DU is a specific area (or volume of soil) about which a decision is to be made. In the ideal and most direct case, the DU and sample unit (SU) are the same; however, a DU may be composed of a single SU, or may include multiple SUs. It is important that the contamination distribution and future use/exposure scenario for the entire area of a DU or SU are consistent. Either the entire or a portion of the SUs composing the DU may be sampled using ISM, and the number of SUs sampled depends on the confidence of the data that are extended from the SUs to the DU. ITRC (2012) provides a Microsoft Excel spreadsheet that allows for the calculation of spatially-weighted DU exposure concentrations from SU exposure concentrations.

1.2.2 Grid Cell

A grid cell is a subdivision of the DU. DUs may be divided into uniform-size grid cells, and one increment is collected from each cell, from the same (or different depending on the sample design) relative location within each grid cell. The shape of the cells is not specified—the only criterion for cell shape selection is that the cells should be of equal size (they can be triangular, square, rectangular, etc.) so the increments collected from each cell are equally weighted over the DU.

1.3 GENERAL CONCEPTS

The use of standard discrete samples to characterize soil contamination has two significant sources of error:

1. Field sampling error is at least 10 times greater than analytical (laboratory-associated) error.

2. A source of analytical error was found to be that in sample processing and subsampling (a single subsample from the 4- or 8-ounce soil jar is taken at the laboratory).

Depending on the areal and vertical contaminant distribution profile, ISM sampling and processing are designed to minimize these sources of error, resulting in an average concentration that is a more precise and accurate estimate of the average contaminant concentration for the DU.

It is also important to note that the horizon characterized by ISM sampling is usually superficial, although ISM may be implemented at greater depth, resulting in much higher associated sampling costs.

2. EQUIPMENT AND MATERIALS

The following equipment and materials may be required:

- Spray paint[1], pin flags, or rope to mark either grid corners or outline the sampling grid
- Incremental sampling tool (i.e., the MI tool developed by the Cold Regions Research and Engineering Laboratory or alternative[2] coring device); stainless-steel spoons or scoops may be used, such that aliquots of equal mass or volume are collected from each aliquot location
- Clean resealable (i.e., Zip-lock®) bags, 5-gallon plastic containers, or other appropriate large container for placing the increments; the size of the container should be adequate to hold the entire ISM sample volume, which is approximately 1-2 kilograms
- Coolers and ice for cold storage of samples after collection
- Field logbook and pen with waterproof black ink for field documentation
- Global Positioning System (GPS) instrument or other survey equipment to document locations of DU or SUs
- Personal protective equipment to be worn during sample collection as required by the Health and Safety Plan for the project.

If ISM sampling is used for volatile organic compound analysis, the increments of equal mass are collected with tools such as EnCore® sampler and placed in a pre-tared container obtained from the analytical laboratory partially filled with methanol. Note the limitations for sample shipment presented in Section 5, Precautions. Multiple methanol preserved sample containers may be used for one ISM sample if necessary.

3. INCREMENTAL SAMPLING METHODOLOGY PROCEDURE

Increments (typically 30 and up to 50 based on project-specific sampling design) of soil of approximately of the same weight or volume will be collected within each cell of the DU.

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[1] Avoid if spray paint is likely to affect MI sample quality.

[2] A source for the MI sampling tool shown in this SOP is Ike Loukos, LES Engineering, Inc. Telephone No. 301-471-3393, email i.loukos@att.net.

For surface soil sampling, a coring tool may be used to facilitate the rapid collection of uniform, representative increments from a consistent depth interval. This way, equal volumes are collected for each increment and equal mass is obtained under the assumption that the density of the sampled medium is uniform across the cell of the DU. The size of the coring tool will be selected based on the volume of the increments, which is in turn calculated based on number and depth of the increments and the fact that an adequate total sample mass is typically 1-2 kilograms dry weight (to overcome effects of compositional heterogeneity due to the inherent particulate nature of soil and sediment). It is not necessary to determine the location of every increment collected using a GPS instrument, as long as the areal extent of the DU or SU within a DU has been properly identified.

The following procedure will be followed within each DU.

- Demarcate the areal extent of the DU in the field using pin flags, spray paint, or rope and fixed with a GPS instrument. Select increments as defined in the project-specific sampling plan.

- Prior to ISM sampling activities, don the personal protective equipment. Then, collect increments from the depth interval specified in the planning documents (usually up to 6 inches deep) using a coring tool or other method that ensures equal volume is collected for each increment. Unless specifically excluded in the sampling plan, include the vegetative mat in the sampled interval. Note that some plans may require sampling of native soil only; the horizontal limits of sampling will be dependent on past disposal practices and the decision to be made. If used, push the stainless-steel sampler into the soil until the sampler is full and will not penetrate further. Remove the sampler carefully, and push the soil out of the sampler with the lever on the side of the instrument (see photos below).



- Place the sample (increment or aliquot) directly into a large re-sealable bag, 5-gallon bucket, or alternative container (note the above photos show placing the aliquot into a sampler's hand only for aliquot visualization purposes). Field experience has found that placing samples into a decontaminated 5-gallon bucket and then pouring the whole sample into a bag is a better process. The likelihood of spilling increases with the use of a bag alone because, as the bag fills up, it is harder to eject additional soil increments into the bag. The bucket is more stable and may prevent loss of fines.

- Fill the holes left by sampling using surrounding soil or, if necessary, use sand to bring the subsurface sampling areas back to original grade. Do not include large rocks or pebbles in samples unless they are part of the overall soil matrix. It is not necessary to decontaminate the sampling tool between the increments within a single DU or SU.

- Obtain a pre-tared wide-mouth glass container and methanol from the analytical laboratory for sample aliquot preservation if collecting an ISM sample for volatile organic compound analysis. Collect increments using EnCore™ or TerraCore™ sampling tools. Note that a much smaller increment volume will be collected, resulting in a smaller total sample volume. Place smaller increments into the pre-tared glass containers containing methanol and follow the health and safety precautions associated with methanol handling. To prevent the loss of methanol through volatilization, keep the sample container closed as much as feasible and open only to place sample aliquots within the container.

- Collect the replicate samples from the same DU/SU following a different path, as shown in Figure SOP No. 057-1, although ITRC (2012) and other research have shown that replicate samples may be taken at the same time as the primary sample, by just using another corner of the grid, or off-stepping a meter or two. Establish the specific relative location of the replicate increments within each DU cell in a random manner to eliminate potential bias. To select the relative increment location for a replicate increment in a cell, divide the cell in turn into subgrids and select a subcell randomly generating a number on a calculator. Another selection method may be performed by rolling a dice for a 6 × 6 subgrid in the DU cell; the first die indicates the row and the second die the column of this subgrid.

- Label the large re-sealable bag containing the total sample volume with indelible ink. Follow the guidance listed under Section 5, Precautions below if methanol preserved sample containers will be shipped. Bubble-wrap and tape the sample(s) for shipping and place into iced coolers for transport under chain-of-custody protocol to the analytical laboratory. Follow the field procedure requirements set forth in EA SOP No. 002 – Chain-of-Custody Form and EA SOP No. 004 – Sample Packing and Shipping. Retain copies of the chain-of-custody forms and shipping documents in the project file. Document field activities according to logbook procedures specified in EA SOP No. 016 – Field Logbooks and Surface Water, Groundwater, and Soil/Sediment Field Checklists.

4. MAINTENANCE

Not applicable.

5. PRECAUTIONS

Safety precautions documented in the project-specific site Health and Safety Plan will be followed. If sampling procedures are to occur in areas where unexploded ordnance is known or potentially exist, the area will not be entered until unexploded ordnance support is provided. If an unsafe condition is identified, stop work immediately until the unsafe condition is mitigated. If sampling for volatile organic compound analysis, follow precautions associated with handling methanol. Also, because much larger quantities of methanol are employed for ISM sampling, follow the International Air Transport Association and Department of Transportation requirements associated with transportation of these samples. If shipped by air, excepted quantities are limited quantity (30 milliliters per inner package/receptable [i.e., sample container] and a total volume of no more than 0.5 liter per outer packaging [i.e., cooler]). Note that the outside of the sample shipment (cooler) should be labeled with excepted quantities marking.

6. REFERENCES

Interstate Technology and Regulatory Council (ITRC). 2012. *Incremental Sampling Methodology*. February.

U.S. Army Corps of Engineers. 2009. Interim Guidance 09-02 – Implementation of Incremental Sampling (IS) of Soil for the Military Munitions Response Program. Environmental and Munitions Center of Expertise Interim Guidance. 20 July.

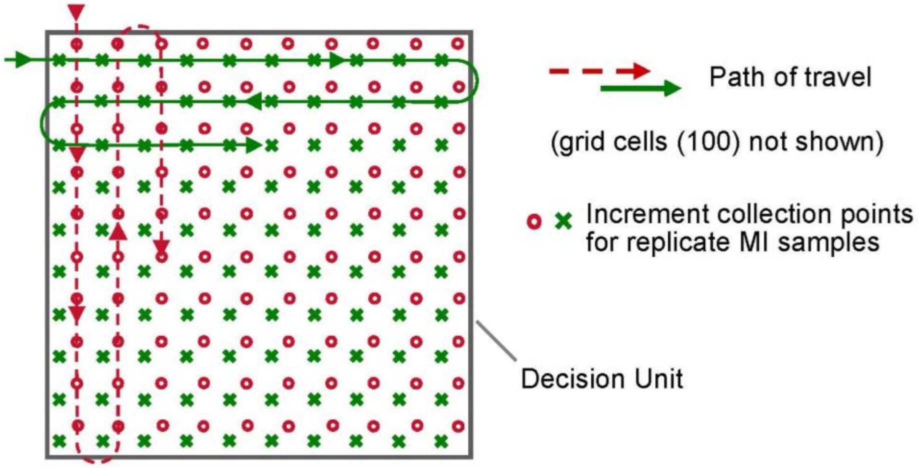

Figure SOP057-1. Example of Incremental Sampling in a Decision Unit.

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Standard Operating Procedure No. 073
for
Sampling for Per- and Polyfluorinated Alkyl Substances

Prepared by

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

Revision 1
June 2019

PROJECT-SPECIFIC VARIANCE FORM

This form is to be completed to indicate if there are client-, project-, or site-specific variances to this Standard Operating Procedure (SOP) (**check Box A**), or if this SOP is being used with no changes (**check Box B**). This form should be archived with the project files.

☐ **A. Variances required; cite section(s) of the SOP to which there is a variance**

☐ **B. No variances**

SOP No. 073	
SOP Section	**Variance**

Project Manager (Name)

Project Manager (Signature) Date

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CONTENTS

DOCUMENT REVISION HISTORY

ORIGINAL (MASTER) DOCUMENT REVISION HISTORY				
Revision Number	**Revision Date**	**Revision Summary**	**Revised By**	**Reviewed By**
1	June 2019	Note regarding water-tight lids	F. Barranco	F. Barranco

1. SCOPE AND APPLICATION

The objective of this Standard Operating Procedure (SOP) is to delineate protocols for collecting environmental samples for analysis of per- and polyfluorinated alkyl substances (PFAS), also known generally as perfluoroalkyl compounds or chemicals (PFCs).

This SOP includes sampling procedures and requirements specific to analysis of PFAS, which are ubiquitous and have a high potential for cross-contamination from common consumer products and sampling materials, even when new and clean. This SOP should be used in combination with appropriate SOPs applicable to the target medium and sampling methodology (e.g., but not limited to SOP No. 007 Surface Water Sampling, SOP No. 013 Collection of Monitoring Well Samples, SOP No. 21 Sediment Sampling, SOP No. 25 Soil Sampling, or SOP No. 047 Direct-Push Technology Sampling).

This SOP was developed primarily based on guidance from the U.S. Army Corps of Engineers (2016) and the Interstate Technology Regulatory Council (ITRC 2018).

2. ACCEPTABLE MATERIALS

Table 1 provides a summary of Prohibited Items that should NOT be used or present during sampling for PFAS because they may contain PFAS, along with Acceptable (PFAS-free) Alternatives that may be used if appropriate for project requirements. In general, in the context of sampling events, PFAS are commonly found in waterproof and nonstick materials (including food packaging, rain gear, and anything containing Teflon®), personal care products, and certain plastics (e.g., low-density polyethylene [LDPE]) and synthetic fibers.

Table 1. Prohibited Items and Acceptable Alternatives for Use during PFAS Sampling

Prohibited Items	Acceptable Alternatives
Field Equipment	
Teflon-containing or LDPE materials (including tubing, bailers, tape)	HDPE or silicone materials
Waterproof field books, plastic clipboards, binders, or spiral hard cover notebooks	Loose paper (non-waterproof) on aluminum or Masonite clipboards
Sharpies®/markers, waterproof pens	Non-waterproof pens or pencils
Sticky notes (e.g., Post-It®) and glues	Not applicable
Re-usable chemical (blue) ice packs	Regular ice in polyethylene bags (double bagged)
Aluminum foil	Thin HDPE sheeting
Plastic spoons used in soil/sediment sampling	Stainless steel trowels/spoons
Reusable core liners	Single-use PVC or acetate liners
LDPE HydraSleeve	HDPE HydraSleeve
Field Clothing and Personal Protective Equipment	
New cotton clothing; synthetic water resistant, waterproof, or stain- treated clothing; clothing containing Gore-Tex™	Well-laundered clothing, defined as clothing that has been washed 6 or more times after purchase, made of natural fibers (preferably cotton)
Clothing laundered using fabric softener	No fabric softener
Boots (e.g., steel-toed or waders) containing Gore-Tex™ or waterproof coatings	Boots made with polyurethane or PVC with no waterproof coating

Prohibited Items	**Acceptable Alternatives**
Coated Tyvek® suits	Uncoated/plain Tyvek suits not containing PFAS
Cosmetics, shampoo, conditioner, body gel, moisturizers, hand cream, waxed dental floss, or other personal care products used on the day of sampling.	Use bar soap not containing moisturizers and rinse well on the day of sampling (including for hand washing). Use any other required products the night before (rather than the day of) sampling.
Paper towels	Air dryers (for hand drying)
No sunscreens or insect repellents except approved 100% natural products such as those noted in the Alternatives column.	**Acceptable Sunscreens:** Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, “free” or “natural” sunscreens for babies **Acceptable Insect Repellents:** Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect Repellant, Herbal Armor, California Baby
Sample Containers	
LDPE or glass containers	HDPE containers (or polypropylene if required)
Teflon-lined caps	Unlined HDPE (or polypropylene if required) caps
Rain Events	
Rain gear that has been treated to make it waterproof/resistant and breathable (e.g., Gore-Tex^{TM} treated)	PVC or polyurethane- or wax-coated rain gear that is confirmed not to contain PFAS, or utilize a gazebo tent that is only touched or moved prior to and following sampling activities.
Equipment Decontamination	
Decon 90	Alconox®, Liquinox®, and/or Citranox®
Water from an onsite well	Potable water from municipal drinking water supply (not containing PFAS), and “PFAS-free” deionized water for final rinse
Food Considerations	
All food and drink, with exceptions noted in the Alternatives column. Paper food packaging (e.g., fast food wrappers, drink cups, paper bags) and foil, in particular, often contain PFAS.	Bottled water and hydration drinks (i.e., Gatorade® and Powerade®) to be brought and consumed only in the staging area
NOTES: HDPE = High-density polyethylene. PVC = Polyvinyl chloride.	

If a plastic product or chemical not included in the Acceptable Alternatives column of Table 1 is proposed for use, it is recommended that Safety Data Sheets and other references be reviewed prior to use to confirm that the material does not contain PFAS. Indications of potential PFAS ingredients, in addition to the items listed in Table 1, include the following materials (ITRC 2018):

- Polytetrafluoroethylene (fluorocarbon solids such as Teflon)
- Fluorinated ethylene propylene
- Ethylene tetrafluoroethylene
- Polyvinylidene fluoride
- Generally, any other ingredient names containing the prefix “fluoro.”

Specific to the use of HDPE sample containers, note that the associated lids are not typically "water-tight." Therefore, HDPE sample containers should be individually placed in water-tight bags prior to placement in shipping containers loaded with ice.

3. PROCEDURES

As stated above, this SOP includes procedures specific to analysis of PFAS, and should be used in combination with the appropriate SOPs applicable to the target medium and sampling methodology.

3.1 GENERAL CONSIDERATIONS

Materials listed in the Prohibited Items column of Table 1 and other materials containing PFAS ingredients should not be used. However, in some cases, these materials must be used due to factors outside the control of the scope of the work or utility of the project team (e.g., health and safety requirements where other hazardous chemicals are present, or where the sampling requirements are prescriptive, unexpected, or time-sensitive). In these cases, the sampling team should purge/rinse equipment adequately with PFAS-free water where available, and collect additional quality control samples (Section 3.7) to assess the degree of cross-contamination associated with the use of known or suspected PFAS-containing materials during sampling.

NOTE: Most steel-toed boots are made from coated leather and synthetic fibers. PVC or polyurethane are preferred PFAS-free materials for boots. If not possible to obtain PFAS-free footwear that comply with specified health and safety requirements for personal protective equipment, then field personnel should minimize contact with footwear while in the sampling area, and always change gloves after touching footwear.

Disposable nitrile gloves shall be worn at all times during PFAS sampling activities. A new pair of nitrile gloves shall be donned after contacting potential contaminants including all non-decontaminated surfaces. New gloves shall also be donned before touching containers used for storage of PFAS samples, decontaminating re-usable sampling equipment, or handling quality control samples (Section 3.7).

Food shall not be eaten within 10 meters of any sampling area. Before eating or drinking, sampling personnel shall remove their gloves and any outer garments (e.g., coveralls) and leave the work area. When finished, sampling personnel shall wash their hands, remove any visible residue, and put new gloves and any outer garments back on prior to returning to the work area.

PFAS-containing stain resistant products are often applied to vehicle seats that have fabric upholstery. Therefore, if no outer garments (e.g., coveralls) will be worn, or if the outer garments will be worn in the field vehicle then, if feasible, the seats of the vehicle should be covered in a well-laundered cotton blanket to avoid contact between clothing and the seats.

Visitors to the sampling area shall remain at least 10 meters at a distance.

As indicated in Table 1, sampling personnel shall not use the personal care products or cosmetics (other than bar soap) prior to or during sample collection on any day. Additionally, clothes worn during sampling should be well-washed natural fibers.

Other personnel who come within 2-3 meters of the sample collection area should follow the guidelines above and in Table 1.

Fluids used during laboratory- or fieldwork (e.g., drilling for monitoring well installation or for deep soil sampling) should be confirmed PFAS-free.

When sampling on a surface water body, associated gear (e.g., waders, life preservers) should be confirmed PFAS-free.

3.2 EQUIPMENT DECONTAMINATION

Wherever possible, dedicated or disposable equipment shall be used to avoid the need for decontamination, which introduces additional potential for cross-contamination.

Large field equipment (e.g., drill rigs) should be decontaminated with potable water using steam or high-pressure water. Laboratory-certified “PFAS-free” water should be used to perform a final rinse of portions of the sampling equipment that will be in direct contact with samples, wherever practical.

Hand-held, non-dedicated sampling equipment, which is used at multiple field sampling locations, shall be decontaminated using the following procedure:

- Rinse with a non-PFAS-containing detergent (e.g., Alconox, Liquinox, or Citranox)
- Rinse with laboratory-provided, “PFAS-free” water (Grade 3 distilled, Millipore deionized)
- Rinse with methanol
- Rinse with laboratory-provided, “PFAS-free” deionized water.

The Safety Data Sheet for the selected detergent should be reviewed to ensure that it does not contain fluoro-surfactant ingredients.

Wherever possible, equipment should be rinsed with “PFAS-free” water immediately prior to use at each sampling location.

3.3 SAMPLE COLLECTION AND PRESERVATION

The sampling team shall coordinate with the analyzing laboratory regarding requirements for sample bottle, volume, and preservation requirements for samples for PFAS analysis, and the laboratory should provide certified “PFAS-free” containers. HDPE bottles with unlined caps are typically used for collection of samples for PFAS analyses. Polypropylene may also be used for specific applications (e.g., collection of drinking water samples to be analyzed for the short list of PFASs by Method 537) (Department of Defense Environmental Data Quality Workgroup 2017).

Containers for collection of PFAS samples shall never be left uncapped, either before or after sample collection, and the lid/cap shall be kept in a gloved hand and not be set down while removed from the container.

Sampling personnel shall put on a clean pair of nitrile gloves immediately prior to collection of each sample for PFAS analyses, prior to removing the lid from the sampling container. After the sample is collected and the container is closed, pens or pencils, but not markers, shall be used in completing sample labels or in the vicinity of samples during collection.

Following sample collection and addition of preservative (if required), sample containers for PFAS analyses shall be placed in coolers with new, double-bagged ice and not re-usable chemical ice packs unless confirmed PFAS-free and regulatorily accepted, such that meltwater does not contact sample containers during transport.

3.4 SOIL/SEDIMENT SAMPLING CONSIDERATIONS

Surface soil and sediment samples for PFAS analyses should be collected using a clean, stainless-steel tool (e.g., a trowel or Ponar grab sampler).

For field collection of soil and sediment cores, single-use PVC, HDPE, or acetate liners shall be used, and samples for PFAS analysis should be collected from the cores directly or using a stainless-steel tool.

3.5 GROUNDWATER SAMPLING CONSIDERATIONS

It is recommended that, where feasible, measurements of monitoring well water levels and well depths be performed after sampling for PFAS to avoid possible cross-contamination.

HDPE or silicone tubing shall be used for purging and sample collection, where applicable. Teflon and LDPE shall NOT be used. During sampling, sampling personnel shall ensure that no tubing or other equipment contacts the inside or rim of the sample bottle. Any foaming observed in the sample during collection should be noted on the chain-of-custody form that accompanies the samples to the analytical laboratory.

If analyses to be performed by the laboratory include less common PFAS chemicals that have relatively high volatility (including fluorotelomers and sulfonamide/alcohols such as fluorotelomer alcohols, fluorotelomer acrylates, and methyl/ethyl fluorosulfonamides and sulfonamidoethanols), then precautions should be taken during sample collection to minimize loss of volatiles (e.g., minimizing turbulence in water as it flows into the sample container).

If use of passive/no-purge sample collection technology is to be utilized, it is critical to confirm that the sampling device does not contain LDPE (e.g., HydraSleeves made of HDPE rather than LDPE may be requested for PFAS sampling).

Filtration is not recommended because the filter may sorb PFAS or be a source of PFAS contamination.

3.6 SURFACE WATER AND POREWATER SAMPLING CONSIDERATIONS

Capped surface water sample containers shall be rinsed multiple times with site surface water prior to sampling.

Because PFAS tend to accumulate at the air/water interface, specific procedures for surface water sampling shall be followed. After rinsing, the capped container shall be lowered into the surface water, with the top pointed down. The container shall then be reoriented with the top pointed upward and opened under water at the depth targeted for sampling, ideally at least 10 centimeters from both the sediment surface and the water surface. During sample collection, the sample collection point shall be positioned upstream of the sampler, gloves, etc. If an extension rod must be used due to the depth of sampling, the rod shall be made of clean, PFAS-free material.

For porewater sampling, the common stainless-steel and PVC samplers, with HDPE and silicone tubing, are acceptable. The samplers should not be reused at multiple sampling locations.

As for groundwater samples, filtration is not recommended.

3.7 FIELD QUALITY CONTROL SAMPLES

It is recommended that field blanks and equipment (i.e., rinsate) blanks be collected at least daily, using laboratory supplied “PFAS-free” water, to detect any cross-contamination that occurred despite precautions taken during sampling. If a peristaltic pump is used for sample collection, then at least one equipment blank should be collected by pumping “PFAS-free” water through the pump with clean HDPE tubing.

Field duplicates should also be collected to assess the precision of the results.

Analysis of trip blanks may be advisable on a project-specific basis, particularly if relatively volatile PFAS chemicals will be analyzed.

The same precautions taken during collection of specified samples should be taken during the collection of quality control samples (Section 3.7).

4. MAINTENANCE

Not applicable.

5. PRECAUTIONS

See detailed precautions noted above.

6. REFERENCES

Department of Defense Environmental Data Quality Workgroup. 2017. *Bottle Selection and other Sampling Considerations When Sampling for Per-and Poly-Fluoroalkyl Substances (PFAS)*. Revision 1.2. July.

Interstate Technology Regulatory Council (ITRC). 2018. *Fact Sheet: Site Characterization Considerations, Sampling Precautions, and Laboratory Analytical Methods for Per- and Polyfluoroalkyl Substances (PFAS).* March.

U.S. Army Corps of Engineers. 2016. *Standard Operating Procedure 047: Per/Poly Fluorinated Alkyl Substances (PFAS) Field Sampling*. March.

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Appendix D

Field Forms

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EA Engineering, Science, and Technology, Inc., PBC
2200 Sixth Avenue, Suite 707
Seattle, WA 98121

NAVFAC NW LTM/O&M
Contract No.: N44255-20-D-6006

FIELD CHANGE REQUEST (FCR)

TASK ORDER	FCR #	DATE
CONTRACTOR	LOCATION	NTR/RPM

1. Document to be changed. (Identify version #, date, section, drawing, etc. to be changed)

2. Description of existing requirement and reason for the change (attach additional sheets/figures as needed)

3. Proposed change(s). (attach additional sheets/figures as needed)

4. Originator (Print)	Title	Signature	Date

5. Reviewed by (Print)	Title	Signature	Date
	Site Supervisor		
	Task Order Manager		
	Program QA Manager		
	NAVFAC NW RPM/NTR		

CHAIN-OF-CUSTODY RECORD

Laboratory Information:

Address:

Phone #: POC:

COC # Page 1 of 1	Cooler # _ # ____1_____ of ____1_____
Lab Quote #	Lab Job #:

Client / Reporting Information	Project Information
Company Name EA Engineering, Science, and Technology, Inc.	**Project Name** NAVFAC NW Keyport Monitoring
Address 2200 6th Avenue, Suite 707	**Street**
City Seattle **State** WA **Zip** 98121	**City** Keyport **State** Washington
Project Contacts: Sherri Wunderlich	**Project #** 6354443
Phone # 360-337-0780	**Email** bnuding@eaest.com, swunderlich@eaest.com, and pacificchem@eaest.com
Samplers's Name	**Purchase Order #**

Analytical Information

Matrix Codes

WW - Wastewater

GW - Groundwater

SW - Surface Water

SO - Soil

W - Water

WQ = field quality control sample

Lab Sample ID	Sample ID / Field Point / Point of Collection	Collection Date	 Time	 Sampled by	Matrix	# of containers	No. of Bottles and preservation None																		**Notes**

Turnaround Time (Business days) **normal**	Data Deliverable Information	
standard TAT per contract	**Send hardcopy lab report to EA Seattle office (Dana Ramquist)** **Level IV and EDD (NEDDs and EQuIS)** **EQuis (EA ENG EQEDD PACIFIC).**	**Contract No. N44255-20-D-6006, Task Order N4425522F4065**

Sample Custody must be documented below each time samples change possession.

Relinquished by Sampler: 1 EA	**Date Time:**	**Received By:** 1	**Date Time:**	**Relinquished by:** 2	**Date Time:**	**Received By:** 2	**Date Time:**
Relinquished By: 3	**Date Time:**	**Received By:** 3		**Relinquished By:** 4	**Date Time:**	**Received By:** 4	**Date Time:**
Relinquished by: 5	**Date Time:**	**Received By:** 5		**Custody Seal #**	**On Ice Y / N** **Labels Match Coc? Y / N**	**Trip Blank Y / N**	**Cooler Temp.** __________°C

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EA Engineering, Science, and Technology, Inc., PBC

2200 6th Ave, Suite 707 Seattle, WA 98121

Well Inspection, Purging, and Field Measurement Form

Contract Number:___________________ Task Order:__________ Naval Installation:_________________________ Site Name: ______________________

Well Data

Well ID:________________________________ Well Head Locked: Y: ___ N: ___ Depth to Water (ft btoc):____________

Total Well Depth (ft btoc):__________ Inner Casing Straight and Clear: Y: ___ N: ___ Depth to Product (ft btoc):____________

Length of Water Column in Well (ft):________ Exterior Seal Good: Y:___ N:___ Product Thickness (ft):____________

Diameter of Well Casing (in):_________ Pooled water in Head: Y:___ N:___ Purge Rate (liters/min):____________

Well Casing Volume (liters/ft):________ Well Volume (liters):________________ Volume Purged (liters):____________

Purge Method: Peristaltic/Submersible/Bailer/Other:________________________________ Date Well Purged:________________

Water Sample Data

Sample ID:__________________________Type:_____________Date:_________________Time:____________# Containers: __________

QC Sample ID:________________________Type:_____________Date:_________________Time:____________# Containers: __________

Sampling Personnel: ____

Remarks (color, odor, etc.): ____

Time	Purge Vol. (liters)	Depth to Water (ft btoc)	Temp. (°C)	pH	ORP (mv)	Spec. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Salinity (% or ppt)	Notes
Stabilization Requirements			**(± 10%)**	**(± 0.2 units)**	**(± 10)**	**(± 10%)**	**(± 10% or <10)**	**(± 10% or ± 0.1)**	**(± 10%)**	
			Initial Depth to Water (pre-pumping)							

Volume Calculations for Well Casings or Discharge Tubing

Volume (liters) = [Casing/tubing volume (liters/ft)] x [Length of water column (ft)]

Well casing diameter (in) → Well casing volume (liters/ft)	Discharge tubing diameter (in) → Discharge tubing volume (liters/ft)
2” → 0.6 4” → 2.5 6” → 5.5	1/4” → 0.010 3/8” → 0.022 1/2” → 0.039

Recorded by:______________________Date: ____________ Page_____of _____ Meter Model: ____________

Reviewed by:______________________Date: ____________ Filename: Well Inspection, Purging, and Field Measurement Form.docx

Appendix E

Project Team Meeting Minutes

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EA Engineering, Science, and Technology, Inc., PBC
2200 Sixth Avenue, Suite 707
Seattle, WA 98121

NAVFAC NW LTM/O&M
Contract No.: N44255-20-D-6006
April 21, 2022

Meeting Minutes

Meeting: Project Kickoff Meeting
Project: 2022 Keyport Long-Term Monitoring/ Long-Term Operation and Maintenance, Naval Base Kitsap, Keyport, Washington
Date, Time: 21 April 2021, 10:00 AM (Pacific)
Location: By Teleconference
Call-in Number: 1-443-342-4948,
Conference ID: 511 257 066#
Contract No.: N44255-20-D-6006
Task Order No.: N4425522F4065
Remedial Project Manager: Amanda Rohrbaugh, NAVFAC NW
Contractor: EA Engineering, Science, and Technology, Inc., PBC (EA)
Anticipated Attendees:

Name	Organization	Email	Phone Number
Amanda Rohrbaugh	NAVFAC Northwest RPM	amanda.l.rohrbaugh.civ@us.navy.mil	(916) 968-8069
Carlotta Cellucci	NAVFAC Northwest RPM, NTR	carlotta.cellucci.civ@us.navy.mil	(206) 595-6711
David Nelson	EA Program Manager	dnelson@eaest.com	(360) 398-3055
Dana Ramquist	EA Task Order Manager	dramquist@eaest.com	(206) 992-0721
Camille Warren (absent)	EA Alternate Task Order Manager	dwarren@eaest.com	(720) 626-6415
Will Kaage (absent)	EA PQCM	wkaage@eaest.com	(360) 420-2373

This meeting was convened to kick-off the above-referenced project. The meeting was opened by introducing the above-referenced project staff/attendees and their project responsibilities. Key discussion points and action items are addressed below.

1. Introductions and project roles
2. Project Scope of Work:
    a. Project Plans
        i. APP/SSHP Addendum
        ii. OU 1 Area 1 QAPP
        iii. 2021 QAPP Addendum OU2 Area 2
    b. IC/LUC/VI Inspections & Reporting
    c. OU 1 O&M & Reporting
    d. OU 1 Sampling & Reporting
    e. OU1 HH/ERA Support Sampling
    f. OU 2 Area 2 Groundwater Sampling & Reporting
3. Project Schedule:
    - Project schedule discussed prioritizing OU 1 SAP.
    - OU1 Sampling to occur 1 month post Pilot Test, beginning of September.
    - Potential extension of POP may be needed. Team will wait and reevaluated need ad project proceeds.
4. Planning Documents:
    - Use of Pilot Study QAPP for OU1 Work Plan for inclusion of sediment, porewater, surface water sampling in OU1 SAP.
5. Personal Vehicles (POVs), company vehicles, parking areas
    - Outage request needed for parking personal vehicles except at landfill parking area.

6. Badging/escorts for high-security areas
    - Indoor access requires NAVFAC NW Representative escort and NAVSEA escort, initiated one month in advance through NAVFAC NW RPM.
    - Walking through workspaces or placing sampling devices in work areas requires advance notification and planning through both installation security and the unions. Union representatives must be provided with notification language that can be disseminated to all employees in the workspace in advance of the work provided in the Notification Summary prepared by EA.
7. IDW Management:
    - Communication with NBK Keyport Waste Coordinator- Christine Stull Building 1021 manages the TSD. Keyport personnel will collect waste samples for EA to containerize.
    - EA to stage IDW at white tent at Area 1 for Keyport personnel to sample. EA will send to laboratory. Ms. Cellucci notes drums should be on pallets if possible.

8. Other Notification – Public Affairs, Base Security, etc.
    - Advanced notification to Steven Chavez for any photos that are planned. Security must review photos on camera prior to leaving installation.

9. If any 3rd party visitors / regulators show up at jobsite, NTR and RPM will be immediately notified. Contractor will not discuss project with 3rd party visitors / regulators.

Action Items:

- Amanda to send most recent Pilot Study QAPP native files.

- Amanda to send WP for sediment sampling done by Battelle.