State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

Notice: Use this form to request **a written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

“Post-closure modification” refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This from should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do not use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located. See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf”

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name	First	MI	Organization/ Business Name		
Nelson	Denice		Tyco Fire Products LP		
Mailing Address			**City**	**State**	**ZIP Code**
2700 Industrial Parkway South			Marinette	WI	54143
Phone # (include area code)	**Fax # (include area code)**		**Email**		

The requester listed above: (select all that apply)

- [x] Is currently the owner
- [ ] Is considering selling the Property
- [ ] Is renting or leasing the Property
- [ ] Is considering acquiring the Property
- [ ] Is a lender with a mortgagee interest in the Property
- [ ] Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

- [ ] Select if same as requester

Contact Last Name	First	MI	Organization/ Business Name		
Johnson	Shauna		Arcadis		
Mailing Address			**City**	**State**	**ZIP Code**
790 N Milwaukee Street, Suite 100A			Milwaukee	WI	53202
Phone # (include area code)	**Fax # (include area code)**		**Email**		
(312) 520-0305			shauna.johnson@arcadis.com		

Environmental Consultant (if applicable)

Contact Last Name	First	MI	Organization/ Business Name		
Johnson	Shauna		Arcadis		
Mailing Address			**City**	**State**	**ZIP Code**
790 N Milwaukee Street, Suite 100A			Milwaukee	WI	53202
Phone # (include area code)	**Fax # (include area code)**		**Email**		
(312) 520-0305			shauna.johnson@arcadis.com		

Section 2. Property Information

Property Name			FID No. (if known)		
Tyco Fire Technology Center - PFCs			438005590		
BRRTS No. (if known)		**Parcel Identification Number**			
0238580694, 0238581955, 0238583856					
Street Address		**City**		**State**	**ZIP Code**
2700 Industrial Parkway South		Marinette		WI	54143
County	**Municipality where the Property is located**		**Property is composed of:**		**Property Size Acres**
Marinette	(●) City ( ) Town ( ) Village of Marinette		( ) Single tax parcel (●) Multiple tax parcels		380

1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

   (●) No ( ) Yes

   Date requested by: ________________

   Reason:

   ____

2. Is the “Requester” enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

   (●) No. **Include the fee that is required for your request in Section 3, 4 or 5.**

   ( ) Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:
Section 3. Technical Assistance or Post-Closure Modifications;
Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [**Numbers in brackets are for WI DNR Use]**

- [ ] No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of $350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.
- [ ] Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of $700.**
- [ ] Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of $1050.**
- [ ] Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of $1050.**
- [ ] Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of $1050.**
- [ ] Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of $1050.**
- [ ] Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of $350**
- [ ] Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of $425.**
- [ ] Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of $425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

- [ ] Schedule a Technical Assistance Meeting - **Include a fee of $700.**
- [ ] Hazardous Waste Determination - **Include a fee of $700.**
- [ ] Other Technical Assistance - **Include a fee of $700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

- [ ] Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of $1050, and:**
  - [ ] Include a fee of $300 for sites with residual soil contamination; and
  - [ ] Include a fee of $350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

  Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this fo

Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

- [ ] Phase I Environmental Site Assessment Report - Date: ________________
- [ ] Phase II Environmental Site Assessment Report - Date: ________________

☐ Legal Description of Property (required for all liability requests and specialized agreements)
☐ Map of the Property (required for all liability requests and specialized agreements)
Analytical results of the following sampled media: Select all that apply and include date of collection.
☐ Groundwater ☐ Soil ☐ Sediment ☐ Other medium - Describe: ____
Date of Collection: ____
☐ A copy of the closure letter and submittal materials
☐ Draft tax cancellation agreement
☐ Draft agreement for assignment of tax foreclosure judgment
☒ Other report(s) or information - Describe: Quality Assurance Project Plan Addendum, Rev 4

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

◯ Yes - Date (if known): ____
◯ No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at: dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

☐ I am the person submitting this request (requester)

☒ I prepared this request for: Denice Nelson
Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Lisa M Rutkowski	3/31/2025
Signature	Date Signed
Senior Environmental Specialist	(414) 277-6233
Title	Telephone Number (include area code)

Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a DNR regional brownfields specialist with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf.

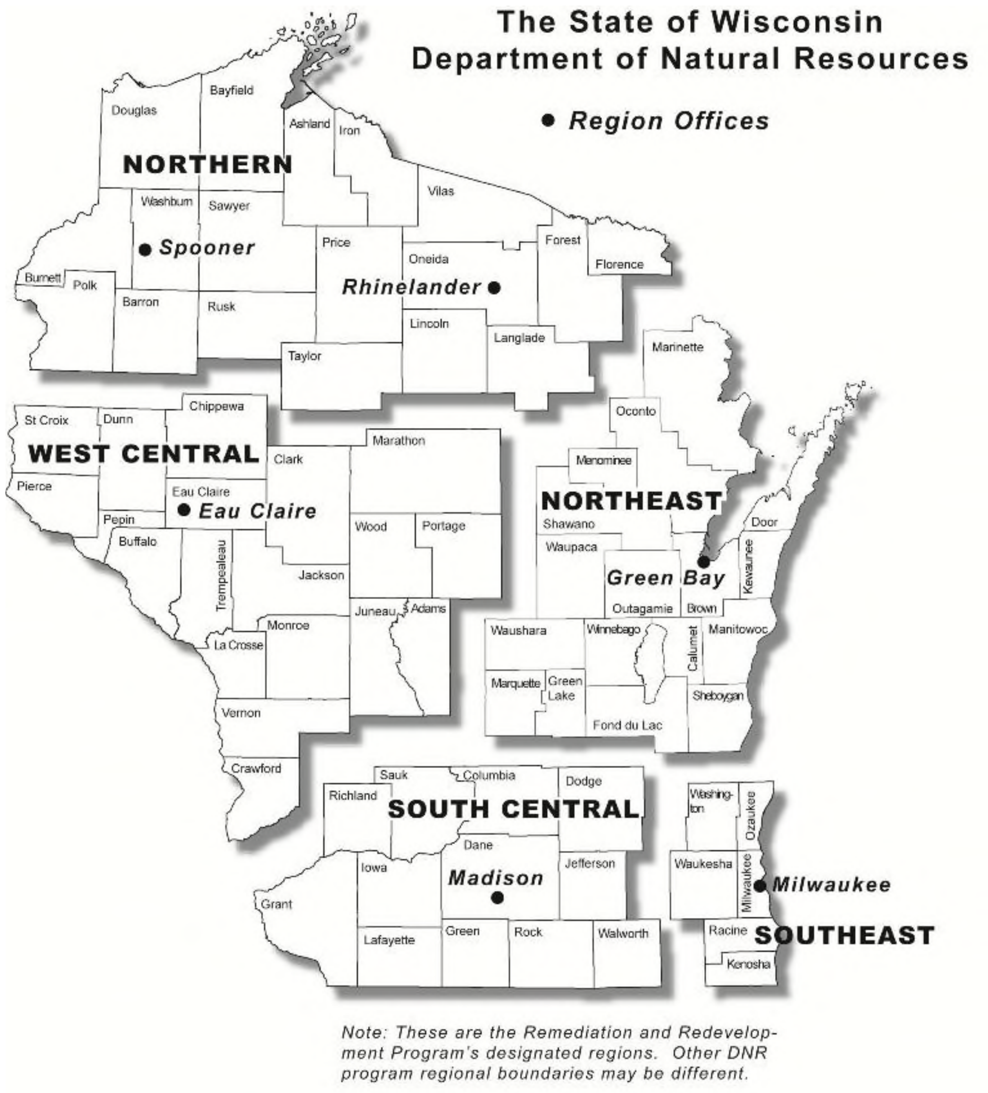
DNR NORTHERN REGION
Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION
Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION
Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION
Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer	Comments		
Fee Enclosed? ◯ Yes ◯ No	Fee Amount $	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		

Title: Quality Assurance Project Plan Addendum
Revision Number: 4
Revision Date: March 2025

Tyco Fire Products LP

Final

Quality Assurance Project Plan Addendum

Tyco Per- and Polyfluoroalkyl Substances (PFAS) Site Investigation and Private Well Sampling Activities
Marinette, Wisconsin

March 2025

Quality Assurance Project Plan Addendum

Tyco Fire Products LP
Marinette, Wisconsin

March 31, 2025

Prepared by
Arcadis U.S., Inc.
790 North Milwaukee Street, Suite 100A
Milwaukee
Wisconsin 53202
Phone: 414 276 7742

Prepared for:
Tyco Fire Products LP
2700 Industrial Parkway South
Marinette, Wisconsin 54143

Todd Church
Program QA/QC Manager

Shauna M. Johnson
Senior Environmental Specialist

Scott T. Potter, PhD
Program Strategic Lead
Chief Hydrogeologist/Sr. Vice President

Version Control

Revision No.	Date Issued	Worksheet Number (and/or Page Number)	Description
Refer to Revision 3 for the descriptions of changes made to Versions 1, 2, and 3			
4	03/31/25	Signature page	Arcadis Milwaukee address updated
4	03/31/25	Contents	Updates to reflect addition of new WS 12-3 for PFAS Method 1633/1633A, potable and non-potable water
4	03/31/25	Introduction	Updates to reflect project progress
4	03/31/25	WS 1 and 2, Item 3	Added new reports since last submittal
4	03/31/25	WS 3 and 5	Updates to Organization Chart; added delegate to PG in Table 1
4	03/31/25	WS 4,7 and 8	Updates to years of experience
4	03/31/25	WS 6	Updates to contacts and contact information; EQuIS submittal frequency; RLTPWSP submittal frequency
4	03/31/25	WS 11	Updates to Step 1, footnote 2 and Table 2
4	03/31/25	WS 12-3, 28-1 through 28-3,	Updates to add PFAS Method 1633/1633A
4	03/31/25	WS 10	Updates to reflect project progress
4	03/31/25	WS 14 and 16	Updates to adjust EQuIS and RLTPWSP due dates; removed potable well annual report; removed draft project schedule deliverable
4	03/31/25	WS 15-1	Updates to Table 2 values (Cycle 12); update to include compounds in PFAS Method 1633/1633A
4	03/31/25	WS 15-2, 15-3, 15-4	Updates to include compounds in PFAS Method 1633/1633A
4	03/31/25	WS 17a	Updates to include DMP as supporting document
4	03/31/25	WS 19 and 30	Updates to include PFAS Method 1633/1633A; new Eurofins Chicago address; removed expiration dates and added note about lab certifications
4	03/31/25	WS 20, 23	Updates to include PFAS Method 1633/1633A
4	03/31/25	WS 24	Updates to include LC/MS/MS, PFAS Method 1633/1633A

Revision No.	Date Issued	Worksheet Number (and/or Page Number)	Description
4	03/31/25	WS 25	Updates to include reference to PFAS Method 1633/1633A
4	03/31/25	WS 26 and 27	Updates to include GETS and EX Well IDs under Sample ID System
4	03/31/25	WS 28-2 through 28-12	Updates to WS references due to addition of new WS 12-3 for PFAS Method 1633/1633A
4	03/31/25	WS 34	Updates to Planning Documents to include DMP
4	03/31/25	WS 36	Updates to WS references and addition of PFAS Method 1633/1633A lab SOP references; updates to validation protocols
4	03/31/25	Appendix B	Includes updated lab certifications

Contents

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Appendices

Acronyms and Abbreviations

%D	percent difference
%R	percent recovery
ºC	degrees Celsius
µg/L	micrograms per liter
AFFF	Aqueous Film Forming Foam
ASTM	ASTM International
Arcadis	Arcadis U.S., Inc.
BOD	Biochemical Oxygen Demand
CAS	Chemical Abstracts Service Registry
cBOD	Carbonaceous Biochemical Oxygen Demand
CCB	continuing calibration blank
CCV	continuing calibration verification
COC	chain-of-custody
COD	Chemical Oxygen Demand
CSM	Conceptual Site Model
CV	calibration verification
CVAA	cold vapor atomic absorption
DFW	Definable Feature of Work
DQI	data quality indicator
DQO	data quality objective
EDD	electronic data deliverable
ES	Enforcement Standard
FTC	Fire Technology Center
FTL	Field Team Leader
FOSA	perfluorooctanesulfonamide
GC/MS	gas chromatography/mass spectrometry
GC-FID	gas chromatography - flame ionization detector
GETS	Groundwater extraction and treatment system
GIS	Geographic Information System
HAL	Health Advisory Limit
HASP	Health and Safety Plan
HEM	n-Hexane Extractable Material
HSO	Health and Safety Officer
IC	ion chromatography

ICAL	initial calibration
ICB	initial calibration blank
ICP-MS	inductively coupled plasma-mass spectrometry
ICS	interference check solution
ISC	instrument sensitivity check
ICV	initial calibration verification
IDW	investigation-derived waste
LC/MS/MS	liquid chromatography tandem mass spectrometry
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LIMS	laboratory information management system
LOQ	Limit of Quantitation
MCL	Maximum Contaminant Level
MDL	method detection limit
mL	milliliter
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable/not available
NELAP	National Environmental Laboratory Accreditation Program
NEtFOSA	N-ethylperfluorooctanesulfonamide
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NEtFOSE	N-ethylperfluorooctanesulfonamidoethanol
ng/g	nanograms per gram
ng/L	nanograms per liter
NOAA	National Oceanic and Atmospheric Administration
OTA	Outdoor Testing/Training Area
PAH	polyaromatic hydrocarbon
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid/ perfluorooctanoate
PFOS	perfluorooctane sulfonic acid/perfluorooctane sulfonate
PM	Project Manager
POET	point-of-entry treatment
ppt	parts per trillion
ppm	parts per million
PSL	Project Screening Level

QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QM	Quality Manager
QP	Quality Procedure
R&D	Research and Development
RCL	Residual Contaminant Level
RF	response factor
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
RT	retention time
SDG	sample delivery group
SOP	standard operating procedure
SPLP	Synthetic Precipitation Leaching Procedure
SVOC	semi-volatile organic compound
TBD	to be determined
TGI	technical guidance instruction
TKN	Total Kjeldahl Nitrogen
Tyco	Tyco Fire Products LP
UPLC	Ultra-Performance Liquid Chromatography
USEPA	United States Environmental Protection Agency
VOA	volatile organic analysis
VOC	volatile organic compound
WDHS	Wisconsin Department of Health Services
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System
WWTP	Wastewater Treatment Plant

Introduction

On behalf of Tyco Fire Products LP (Tyco), Arcadis U.S., Inc. (Arcadis) has prepared this Quality Assurance Project Plan (QAPP) in support of additional site investigation and off-site private well sampling related to the potential presence of per- and polyfluoroalkyl substances (PFAS). These investigations are occurring in the City of Marinette and Town of Peshtigo, Wisconsin.

Tyco owns and operates two facilities in Marinette. The Fire Technology Center (FTC), located at 2700 Industrial Parkway South, Marinette, Wisconsin, is a fire suppressant training, testing, research, and development facility that was constructed in the early 1960s. The FTC facility encompasses approximately 380 acres used for Research and Development (R&D) and Quality Testing activities, with approximately 9 acres previously used as an Outdoor Testing/Training Area (OTA). Tyco also operates a 66-acre fire extinguisher and fire suppression system manufacturing facility at 1 Stanton Street, Marinette, Wisconsin.

Aqueous film-forming foams (AFFF) sold by Tyco and/or others have been used at the FTC as part of R&D, quality control, and firefighting training activities. PFAS such as perfluorooctanoic acid (PFOA) have been present in various formulations of these foams. PFAS have been detected in groundwater at the FTC and in off-site potable wells. The PFAS present in AFFF are non-volatile. No manufacturing stack emissions have occurred at either Tyco facility. Outdoor releases of AFFF occurred at the FTC as part of OTA testing and training activities; however, AFFF has not been used outdoors at the OTA since November 2017. Firefighter training and foam testing did not occur at the Stanton Street facility. At the Stanton Street facility, where PFAS have been detected in on-site groundwater, potential PFAS releases are suspected to have been incidental occurrences related to normal facility handling of foams. Blending of fluorinated foams at the Stanton Street facility ceased in June 2024. In the past, both facilities discharged permitted industrial and laboratory wastes to the City of Marinette Wastewater Treatment Plant (WWTP), but that practice has ceased. Foam-containing wastewater from the FTC is currently treated by an onsite wastewater treatment system before being discharged under a permit to the Marinette WWTP.

The U.S. Environmental Protection Agency (USEPA) classifies PFAS as a category of "emerging contaminants". Proposed PFAS standards for regulated media continue to evolve[1]. Humans who may be exposed to PFAS via ingestion of groundwater are the major receptors of concern in the investigation to date and for future planned investigation activities. Human exposure may also occur via direct contact exposure of PFAS-containing media such as soil and via ingestion of PFAS-containing tissue. PFAS transport through surface water and groundwater are the primary transport pathways relevant to the design of site investigation and private well sampling. The aerial transport pathway was further evaluated in 2021 finding low levels of onsite PFAS. This study concluded that the low levels of onsite PFAS concentrations, together with the results of statistical and spatial analyses, demonstrate that there is not a plausible offsite aerial transport and deposition pathway associated with AFFF uses at the Site. The August 2024 Site Investigation Status and Interim Long Term Monitoring Report (Arcadis) confirmed the horizontal and vertical extents of the groundwater plume and further defined the concentrations of PFAS within the plume. Additional surface water and groundwater sampling activities are ongoing.

This QAPP details the planning processes for collecting investigation sampling data and describes the implementation of quality assurance (QA) and quality control (QC) activities developed for this program. The

[1] In February 2025, Wisconsin Department of Health Services (WDHS) recommended individual groundwater standards of 4 ng/L for PFOA and PFOS, 10 ng/L for PFHxS, PFNA, and HFPO-DA, and 2,000 ng/L for PFBS. Following the February 2025 WDHS recommendation, the WDNR Secretary and the Governor signed the WDNR scope statement and WDNR is in the early stages of rule development for these groundwater standards.

objectives of this QAPP are to generate project data that are technically defensible and useful in meeting the project goals. The project goals are to define the nature and extent of PFAS during the site investigation and private well sampling activities that Tyco is conducting in the City of Marinette and Town of Peshtigo, Wisconsin. This QAPP is supplemented by individual Site Investigation Work Plans, which identify specific sampling locations. The QAPP consists of four main components:

1. Project Management
2. Measurement and Data Acquisition
3. Assessment and Oversight
4. Data Validation and Usability

The above components incorporate QA/QC requirements cited within the following documents:

- USEPA Requirements for Quality Assurance Project Plans, USEPA QA/R-5, March 2001.
- USEPA Uniform Federal Policy for Quality Assurance Project Plans, Final Version, March 2005.
- USEPA Guidance on Systematic Planning Using the Data Quality Objectives Process, USEPA QA/G-4, EPA/240/B-06/001, February 2006.
- USEPA Guidance on Quality Assurance Project Plans, CIO-2106-G-05, January 2012.
- Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations (EA-19-0001), Version 12, December 2019.

The Wisconsin Department of Natural Resources (WDNR) has been overseeing PFAS investigations in groundwater, soil, surface water, and sediment at the Tyco facilities since 2016. These investigation activities have provided a detailed understanding of the nature and extent of PFAS originating from the FTC.

Tyco is in the process of installing private deep replacement wells in the Town of Peshtigo as a long-term drinking water solution for residents. Tyco also began operating a groundwater extraction and treatment system (GETS) to remove PFAS from groundwater in 2022 and optimization activities associated with the GETS are ongoing. Two PFAS treatment plants were designed to remediate surface water at 125 gallons per minute and 700 gallons per minute in Ditch A and Ditch B, respectively. These systems were installed and began operating in 2018 and 2019.

QAPP Worksheet #1 & 2 – Title and Approval Page

1. Project Identifying Information
   a. Site name/project name: Tyco PFAS Investigations in Marinette and Peshtigo, Wisconsin
   b. Site location/number: Marinette and Peshtigo, Wisconsin
   c. Contract/Work assignment number: BRRTS No. 02-38-580694, BRRTS No. 02-38-581955, and BRRTS No. 02-38-583856.

2. Lead Organization: Tyco
   a. Tyco Project Manager (PM) (name/title/signature/date)

Tyco PM: ______________________________

Printed Name/Organization: Denice Nelson, Senior Director, Remediation & Strategy

   b. Tyco Quality Manager (QM) (name/title/signature/date)

Tyco QM: ______________________________

Printed Name/Organization: Denice Nelson, Senior Director, Remediation & Strategy

3. List plans and reports from previous investigations relevant to this project

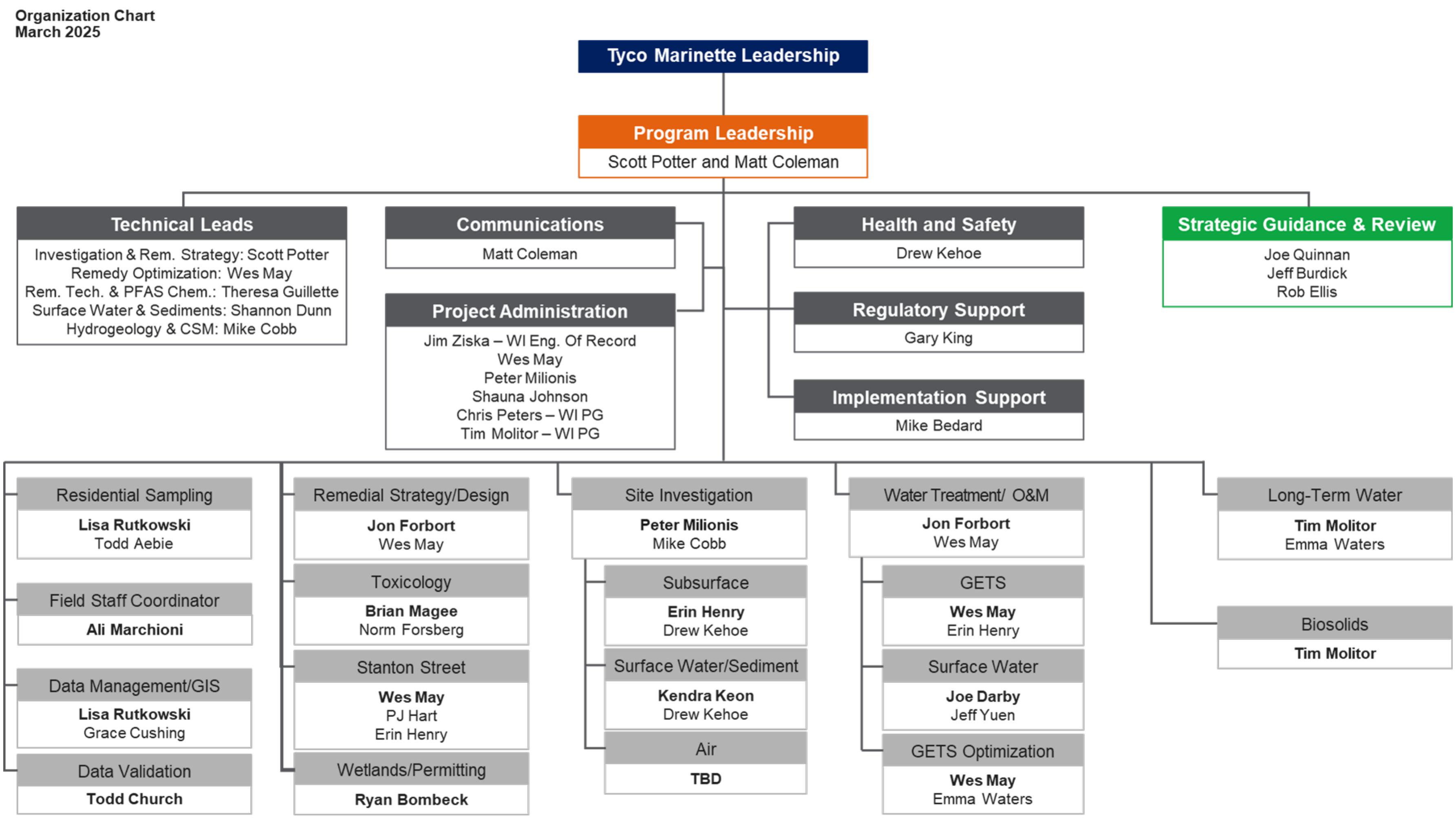
Title	Date
Refer to Revision 3 for the full list of reports prior to Revision 4	March 2024
QAPP Addendum	March 2024
Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan – Interim Action Status Update (Tyco FTC)	April 2024
Revised Comprehensive Alternative Water Management Plan (Tyco FTC)	April 2024
Revised Long-Term Potable Well Sampling Plan, v.9 (Tyco FTC)	April 2024
Summary of Material Management Plan Activities, Stormwater Separation Project (Tyco Stanton Street Facility)	April 2024
Q1 2024 Project Status Report	April 2024

Title	Date
Ditch B Semi-Annual Operation, Maintenance, and Optimization Progress Report #9 (Tyco FTC)	April 2024
Ditch A Semi-Annual Operation, Maintenance, and Optimization Progress Report #10 (Tyco FTC)	April 2024
Proposed Groundwater Monitoring Plan (VOCs) (Tyco FTC)	April 2024
Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan – Interim Action Status Update (Tyco FTC)	May 2024
Additional Site Investigation Work Plan (Tyco Stanton Street Facility)	May 2024
Exemption Request for Reuse of On-Site Soils, Construction at Building 114 Project (Tyco FTC)	May 2024
Deep Aquifer Bedrock Well Design and Long-Term Monitoring Update – Quarterly Deep Private Well Update (March – May 2024) (Tyco FTC)	May 2024
Modification to the GETS (Tyco FTC)	May 2024
Response to April 17, 2024 Comments – Response to Interim Long Term Monitoring Plan for Groundwater and Surface Water (Tyco FTC)	June 2024
GETS Semi-Annual Monitoring – November 13, 2023 through May 12, 2024 (Tyco FTC)	June 2024
Response to May 8, 2024 Comments – Response to Revised Comprehensive Alternative Water Management Plan (Tyco FTC)	June 2024
Exemption Request for Beneficial Reuse of Soils (Tyco FTC)	July 2024
GETS Short-Term Monitoring Phase Report #3 – Lab Report Addendum (Tyco FTC)	July 2024
Q2 2024 Project Status Report	July 2024
Exemption Request for Beneficial Reuse of Soils (Tyco FTC)	July 2024
High Capacity, School or Wastewater Treatment Plant Well Approval Request (EX-10, EX-11, EX-0) (Tyco FTC)	July 2024
High Capacity, School or Wastewater Treatment Plant Well Approval Request (EX-12, EX-13, EX-14) (Tyco FTC)	July 2024
Potable Well Sampling Program Annual Summary Report (Tyco FTC)	July 2024
Notice of Termination, WDPES General Permit Discharge for the Soil Interim Remedial Action (Tyco FTC)	August 2024
WPDES General Permit No.: WI-0046566-07-0 GETS Request to Modify Permit (Tyco FTC)	August 2024
2024 Site Investigation Status and Interim Long Term Monitoring Report (Tyco FTC)	August 2024
Deep Aquifer Bedrock Well Design and Long-Term Monitoring Update – Quarterly Deep Private Well Update (June - July 2024) (Tyco FTC)	September 2024
Revised Long-Term Potable Well Sampling Plan, v.10 (Tyco FTC)	October 2024
Response to GETS Progress Report #3 (Nov. 13, 2023 – May 12, 2024) (Tyco FTC)	October 2024
Notification of Construction for Hydrogen Peroxide Modification at GETS (Tyco FTC)	October 2024

Title	Date
Q3 2024 Project Status Report	October 2024
Ditch A Semi-Annual Operation, Maintenance, and Optimization Progress Report #11 (Tyco FTC)	October 2024
Ditch B Semi-Annual Operation, Maintenance, and Optimization Progress Report #10 (Tyco FTC)	October 2024
Combined (GETS, Ditch A, and Ditch B) WPDES Permit Pre-Application Form 3400-256 (Tyco FTC)	October 2024
Deep Aquifer Bedrock Well Design and Long-Term Monitoring Update – Interim Quarterly Deep Private Well Update (August –September 2024) (Tyco FTC)	October 2024
Notification of Construction for Lime Dosing and Geotextile Tube (Tyco FTC)	December 2024
GETS Expansion Stormwater Control Notice of Intent (Tyco FTC)	December 2024
GETS Short-Term Monitoring Phase Report #4 (Tyco FTC)	December 2024
Q4 2024 Quarterly Status Report	January 2025
Deep Aquifer Bedrock Well Design and Long-Term Monitoring Update – Quarterly Deep Private Well Update (October-December 2024) (Tyco FTC)	January 2025
Exemption Request for Beneficial Reuse of Soils (Tyco FTC)	February 2025
2024 Foam Monitoring Interim Action Report (Tyco FTC)	February 2025

QAPP Worksheet #3 & 5 – Project Organization and QAPP Distribution

Figure 1: Project Organization



Primary Analytical Lab: Eurofins

Table 1: Contact Information for WDNR, Tyco, and Arcadis Team Members

Team Member (Affiliation)	Contact Information	Roles and Responsibilities
Alyssa Sellwood (WDNR)	PH: (608) 266-3084 Email: alyssa.sellwood@wisconsin.gov	WDNR **Project Manager** Review and approve documents submitted by Tyco. Provide oversight on project direction. Attend project meetings as needed.
Denice Nelson (Tyco)	PH: (651) 280-7359 Email: denice.karen.nelson@jci.com	Tyco **Project Manager** Review all site work plans and reports. Provide technical and management oversight on project related activities. Attend project meetings as needed.
Scott Potter (Arcadis)	PH: (267) 685-1805 Email: scott.potter@arcadis.com	Arcadis **Program Strategic Lead** Maintain communication with Tyco on project performance and decision-making. Lead Arcadis contact with WDNR. Review reports sent to WDNR. Attend project meetings. Identify project resources. Address overall management issues. Provide programmatic support and reporting to WDNR.
Jim Ziska, PE (Arcadis) Delegate: Shauna Johnson (Arcadis)	PH: (612) 339-9434 Email: jim.ziska@arcadis.com PH: (312) 575-3732 Email: shauna.johnson@arcadis.com	Arcadis **Professional Engineer of Record** Perform day-to-day project communication tasks. Lead day to day coordination of tasks, field work, and deliverables. Prepare/submit progress reports to Tyco. Assist the Program Strategic Lead with client meetings and submittals.
Chris Peters, PG (Arcadis) Delegate: Tim Molitor, PG (Arcadis)	PH: (414) 277-6231 Email: chris.peters@arcadis.com PH: (612) 373-0220 Email: timothy.molitor@arcadis.com	Arcadis **Senior Advisor, Professional Geologist** Review and certify investigation reports and provide project document quality control.
Matt Coleman (Arcadis)	PH: (315) 671-9641 Email: matthew.coleman@arcadis.com	**Program Lead/Project Communications Manager** Maintain communication with Tyco on project performance and decision-making. Oversee management and staffing of toll-free phone line including residential sampling scheduling and question response. Coordinate results letters consistent with NR700 notification requirements. Assist in development of public outreach materials including fact sheets, presentations, posters, and letters.

Team Member (Affiliation)	Contact Information	Roles and Responsibilities
Shannon Dunn (Arcadis) Delegates: Peter Milionis Mike Cobb (Arcadis)	PH: (206) 399 5307 Email: shannon.dunn@arcadis.com PH: (267) 685-1815 Email: peter.milionis@arcadis.com PH: (207) 613-8351 Email: michael.cobb@arcadis.com	Technical Lead**, Site Investigations** Overall technical oversight of development and execution of work plans. Lead development of site conceptual models. Perform technical review of project deliverables. Lead project technical meetings. Participate in project meetings as needed.
Mike Cobb, (Arcadis)	PH: (207) 613-8351 Email: michael.cobb@arcadis.com	Technical Lead**, Data Evaluation** Overall review of meaning and interpretation of data. Provide input to technical design of work plans. Perform technical review of all project deliverables. Participate in project meetings as needed.
Todd Church (Arcadis) Delegate: Jennifer Singer (Arcadis)	PH: 315 671 9627 Email: todd.church@arcadis.com PH: (716) 667-6664 Email: jennifer.singer@arcadis.com	**QA Manager** Lead preparer of QAPP. Manage data validation for chemical data received from the subcontract laboratory. Provide oversight to laboratory. Participate in project meetings as needed.

QAPP Worksheet #4, 7 & 8 – Personnel Qualifications and Sign-Off Sheet

ORGANIZATION: Tyco

Name	Project Title/Role	Education/Experience & Specialized Training and Certifications	Signature*/Date
Denice Nelson	Tyco PM	B.S. Civil Engineering, M.S. and Ph.D. Civil/Environmental Engineering. >20 years of experience in site investigation, remediation strategy and design and installation of remedial systems. PE Civil Engineering, MN.	☒

ORGANIZATION: Arcadis U.S., Inc. (Arcadis)

Name	Project Title/Role	Education/Experience & Specialized Training and Certifications	Signature*/Date
Scott Potter, PhD, PE	Program Strategic Lead; Technical Lead, Investigation and Remediation	B.S. and M.S. Environmental Engineering, Ph.D. Civil Engineering. >35 years of hydrogeology, hydrogeology and groundwater modelling, design, consulting, and related experience, including technical project/program management for investigation. PE Civil Engineering, PA.	☒
Jim Ziska, PE	Wisconsin Engineer of Record	B.S. Mechanical Engineering. >15 years of experience in engineering, environmental site assessment, and project management. PE Wisconsin #47358.	☒
Matt Coleman	Communications Manager	B.A. Media Communication. >15 years of experience in environmental communications including public outreach, training program development, technical writing and editing, corporate communications, and event planning.	☒
Chris Peters, PG	Senior Advisor, Registered Professional Geologist in Wisconsin	B.S. and M.S. Geology and M.S., Water Resources Management. >40 years of experience in solid waste management, RCRA and state-led (Part 201) remedial investigations, including significant experience with PFAS groundwater and soil investigations, hydrogeologic investigations, surface water management and permitting, expert testimony, and regulatory liaison services. PG Wisconsin.	☒
Shannon Dunn	Technical Lead, Site Investigations	B.S Geology. M.S. Oceanography. >20 years of experience. Leads Arcadis' sediment national technical group. Works on sediment and aquatic sites across the country and internationally.	☒
Mike Cobb	Technical Lead, Geology and Hydrogeology, Data Evaluation	B.A. and M.S. in Geology. >20 years of experience. Leads Arcadis's bedrock hydrogeology national technical practice area. Experience includes a wide range of Federal and state-lead projects across U.S. with focus on fractured rock hydrogeology, and conceptual site model development. PG, Minnesota and Pennsylvania.	☒

Name	Project Title/Role	Education/Experience & Specialized Training and Certifications	Signature*/Date
Wes May PE	Technical Lead, GETS Optimization	B.S. and M.S. Geological Engineering. >25 years of experience in project management, design engineering, and construction of groundwater, industrial wastewater, landfill leachate, and stormwater treatment systems. PE Wisconsin.	☒
Theresa Guillette	Technical Lead, Remedial Technology and PFAS Chemistry	B.S. Biology, Ph.D. Environmental Science. >10 years of experience and research in analytical method development for PFAS with high resolution mass spectrometry, soil characterization/remediation, and fate/transport of PFAS within the environment.	☒
Drew Kehoe	Program Health and Safety Manager	B.S. Geology. 9 years of experience water sampling, core logging, construction oversight and reporting.	☒
Todd Church	QA Manager	B.S. Environmental Management. >35 years of environmental chemistry experience.	☒

ORGANIZATION: Eurofins[1]

Name	Project Title/Role	Education/Experience	Signature*/Date
Sandie Fredrick	PM	B.S. Cellular Biology, Minor Microbiology UW Wisconsin 1997; 15 years of experience as a project manager. 25 years of experience in a commercial laboratory.	☒

ORGANIZATION: SGS AXYS[2]

Name	Project Title/Role	Education/Experience	Signature*/Date
Ivona Zysk	PM	B.S. Biochemistry Minor Business; M.S. Environment and Resource Management; 6 years as project manager at SGS AXYS with experience in both commercial and academic laboratories prior.	☒

Footnotes:

* = Signatures indicate personnel have read and agree to implement this QAPP as written.

[1] = Eurofins Chicago will serve as the primary laboratory. Eurofins Chicago will subcontract work to Eurofins Sacramento for PFAS analysis; Eurofins Eaton for pesticides and metals (lead) analysis of drinking water; Eurofins Burlington for 1,4-Dioxane analysis in drinking water; Eurofins Denver for perchlorate analysis in waste characterization samples; Eurofins Savannah for chlorine analysis in waste characterization samples, Eurofins St Louis for radionuclide analysis, and Eurofins Pittsburgh for total organic carbon in soils analysis.

[2] = SGS AXYS is the secondary laboratory utilized on this project for fish tissue analysis only.

QAPP Worksheet #6 – Communications Pathways

Communication Driver	Organization	Name	Contact Information	Procedure (e.g., timing, pathway, documentation)
Regulatory Agency Interface	WDNR	Alyssa Sellwood, WDNR PM	PH: (608) 266-3084 Email: alyssa.sellwood@wisconsin.gov	Review and approve (as appropriate) site investigation work plans, reports and data submissions.
Review of WDNR Deliverables and Authorization to Complete Work	Tyco	Denice Nelson, Tyco PM	PH: (651) 280-7259 Email: denice.karen.nelson@jci.com	Review site investigation work plans, reports, and data submissions prior to WDNR submission. Provide approval before completing work.
EQuIS and Geographic Information System (GIS) Updates	Arcadis	Lisa Rutkowski, Data Manager	PH: (414) 277-6233 Email: lisa.rutkowski@arcadis.com	Monthly electronic submission to WDNR.
Receipt of New Data	Arcadis	Lisa Rutkowski, Data Manager	PH: (414) 277-6233 Email: lisa.rutkowski@arcadis.com	Provide final data reports to WDNR and, if applicable, private property owners, within 10 business days of receipt.
Quarterly Progress Reports	Arcadis	Shauna Johnson, Arcadis PM	PH: (312) 575-3732 Email: shauna.johnson@arcadis.com	Provide summary of past quarter field work, deliverables, issues identified, corrective actions, WDNR/Tyco correspondence, and upcoming planned activities on April 15 (Q1), July 15 (Q2), October 15 (Q3), and January 15 (Q4).
Revised Long Term Potable Well Sampling Plan Update	Arcadis	Lisa Rutkowski, Data Manager	PH: (414) 277-6233 Email: lisa.rutkowski@arcadis.com	Provide update to long term potable well sampling plan and point of entry treatment system management plan annually by October 1.
Minor field modifications not affecting data usability or quality	Arcadis	Task Managers	Various	Relevant Arcadis project team member will contact Task Manager to resolve sampling and analytical issues and secure verbal approval. Task Manager will evaluate modifications and discuss with Technical Lead Site Investigations and/or Technical Lead Geology and Hydrogeology, if necessary.

Communication Driver	Organization	Name	Contact Information	Procedure (e.g., timing, pathway, documentation)
Field modifications affecting data usability or quality	Arcadis	Lisa Rutkowski, Data Manager	PH: (414) 277-6233 Email: lisa.rutkowski@arcadis.com	Relevant Arcadis project team member will contact Task Manager. Task Manager will notify Technical Lead Site Investigations. Technical Lead will evaluate modifications and discuss with Technical Lead Geology and Hydrogeology, as appropriate, and notify the Arcadis PM, Project Lead, Tyco, and WDNR PMs as necessary before providing verbal approval.
Field progress reports	Arcadis	Task Managers	Various	Arcadis field staff will send completed field notes to the Task Managers and supervising staff after the daily completion of work. Task Managers will review field progress reports, follow up with field staff on corrective actions, and notify Technical Lead Site Investigations of field modifications affecting data usability or quality.
Stop work due to safety issues	Arcadis	Drew Kehoe, Project Health and Safety Officer (HSO)	PH: (414) 277-6229 Email: drew.kehoe@arcadis.com	Work may be stopped at any time for any safety concern. Persons other than the responsible entity may also stop work for safety concerns. The Tyco PM will be notified within one hour of any significant safety-related work stoppages and will be consulted prior to re-starting work.
QAPP changes prior to field work	Arcadis	Lisa Rutkowski, Data Manager	PH: (414) 277-6233 Email: lisa.rutkowski@arcadis.com	Evaluate proposed QAPP modifications. Technical Lead Data Evaluation or Technical Lead Site Investigations submit documented amendments within 10 working days to WDNR for approval.
QAPP changes during project execution	Arcadis	Lisa Rutkowski, Data Manager	PH: (414) 277-6233 Email: lisa.rutkowski@arcadis.com	Evaluate proposed QAPP modifications. Secure same-day approval from the Technical Lead. Technical Lead Data Evaluation or Technical Lead Site Investigations will secure approval for modifications to the QAPP addendum as necessary from WDNR. All approved modifications will be included in the amendments to the QAPP and approved within seven working days.
Sample receipt variances	Eurofins or SGS AXYS	Sandie Fredrick Ivona Zysk	PH: (920) 261-1660 Email: sandra.fredrick@et.eurofinsus.com PH: (250) 655-5838 Email: ivona.zysk@sgs.com	All project field sample variance issues will be reported by the laboratory to the QA Manager within two business days of identification of the technical concern.

Communication Driver	Organization	Name	Contact Information	Procedure (e.g., timing, pathway, documentation)
Laboratory QC variances	Eurofins or SGS AXYS	Sandie Fredrick Ivona Zysk	PH: (920) 261-1660 Email: sandra.fredrick@et.eurofinsus.com PH: (250) 655-5838 Email: ivona.zysk@sgs.com	All QA/QC issues with project field samples will be reported by the laboratory to the QA Manager within two business days of identification of the technical concern.
Analytical corrective actions	Eurofins or SGS AXYS	Sandie Fredrick Ivona Zysk	PH: (920) 261-1660 Email: sandra.fredrick@et.eurofinsus.com PH: (250) 655-5838 Email: ivona.zysk@sgs.com	The need for laboratory corrective actions will be determined by the QA Manager and/or Laboratory PM, as appropriate, and will be documented in a memorandum to the Arcadis Technical Lead and PM. The Arcadis PM will notify WDNR if the changes to the data impact reports/data that have already been submitted. Otherwise, the memorandum will be included with the validated data.
Data verification issues, e.g., incomplete records	Eurofins or SGS AXYS	Sandie Fredrick Ivona Zysk	PH: (920) 261-1660 Email: sandra.fredrick@et.eurofinsus.com PH: (250) 655-5838 Email: ivona.zysk@sgs.com	Report all QA/QC issues with project field samples to QA Manager within two business days.
Data validation issues, e.g., non-compliance with procedures	Arcadis	Todd Church, QA Manager	PH: (315) 671-9627 Email: todd.church@arcadis.com	Review data validation reports. Evaluate validation issues and take appropriate action, if necessary. Notify Technical Lead Site Investigations and Technical Lead Data Evaluation of significant deviations.
Data review corrective actions	Arcadis	Todd Church, QA Manager Additional Data Validators may be used.	PH: (315) 671-9627 Email: todd.church@arcadis.com	Verify/validate the analytical chemistry of field sample results from analytical laboratories and report findings to the QA Manager. Notify QA Manager via email of validation issues within 24 hours of identification of the technical concern.

QAPP Worksheet #9 – Project Planning Session Summary

This is an ongoing project, with many elements already fully completed or underway. For additional project planning information, refer to the work plans, data summaries, and reports listed in **Worksheet #1 & 2**, Item 3.

QAPP Worksheet #10 – Conceptual Site Model

FTC CSM

A detailed report describing the FTC Conceptual Site Model (CSM) was submitted to WDNR in May 2020. Tyco responded to WDNR comments on the FTC CSM in January 2021 and the CSM is regularly updated to reflect additional data collected through site investigation and monitoring activities as reported in Site Investigation Status Reports and Interim Long Term Monitoring Reports. The FTC site history, background, and current CSM are summarized in the March 2025 Interim Long Term Monitoring Report #2 (Arcadis).

Key Physical Aspects of the Site

The surficial geology in the Marinette area is mapped by the United States Geological Survey as Quaternary glacial lake deposits, consisting of mainly clay, silt, and sand, overlying Ordovician dolomite bedrock of the Sinnipee Group (Oakes and Hamilton 1973). Borings completed in the FTC investigation area have shown that the unconsolidated deposits can vary in thickness and composition throughout. Near the FTC, the thickness of unconsolidated deposits can be as little as 14 feet while the thickness near the shore of Green Bay can be upwards of 100 feet. The unconsolidated deposits are comprised of a surficial sand unit, a deeper sand unit, and one or more distinct and discontinuous beds of silt or clay. The surficial sand is described as a well sorted, fine to medium grained, brown sand, while the deeper sand is a poorly sorted, fine to coarse grained greyish brown sand. The silt-clay unit generally consists of a dense, greyish brown, clayey silt with some fine sand and becomes more predominantly clay toward the Green Bay shoreline. These silt-clay beds act as aquitards and are located both within the sand stratigraphy as well as at the base of the unconsolidated sediment. The silt clay beds are laterally discontinuous throughout the FTC investigation area.

Surface water runoff in the area of the site is drained by ditches that flow to Green Bay (Figure 3). These ditches are not formally named but are referred to in this QAPP by letter (A, B, C, and D). Ditch A is present primarily on the west side of the OTA and is oriented generally north to south through the FTC (Figure 3). This ditch has intermittent flows and connects to an unnamed tributary to the Little River, and ultimately to Green Bay. Ditches B through D flow generally northwest to southeast and ultimately drain to Green Bay.

The ditches gain or lose water to groundwater depending on location and season. The upstream portion of Ditch A is frequently under losing conditions. Downstream of the site, the ditches are normally under gaining conditions. Short duration reversals can occur during wet periods.

Groundwater flows predominantly to the east towards Green Bay; however, there is a secondary component that flows to the Northeast towards the Menominee River. Local groundwater levels are also influenced by the streams and ditches within the investigation area.

Sources of PFAS and Transport Mechanisms

The predominant release mechanism of PFAS at the site was via the testing and training of firefighting foams within the OTA. PFAS migrated along surface flow pathways away from the site and downwards to soil and groundwater via infiltration. Surface water and groundwater are the major routes of transport of PFAS away from the FTC. There is not a plausible aerial deposition pathway at the FTC (Arcadis 2022).

Receptors of Concern

In the area surrounding the FTC, humans who may be exposed to PFAS via ingestion of PFAS-containing groundwater are the major receptors of concern in this investigation. In 2017, Tyco began providing bottled water and point-of-entry treatment (POET) units for residential wells within the PWSA that might have been affected by PFAS related to Tyco's historic operations at the FTC. At this time, every property in the PWSA either (a) is non detect for PFAS (including those that have a new private deep bedrock well), or (b) is receiving bottled water and/or has a POET that Tyco installed and maintains. As noted, Tyco is currently in the process of delivering long-term drinking water solutions to this area and has already installed 100 private deep bedrock wells as requested by property owners. There are also 31 additional parcels in the area that are not developed and for which there are no current residences or drinking water receptors. Tyco has or will work with these property owners to install deep bedrock wells on these properties as well, but there are currently no drinking water receptors on these properties.

Human exposure may also occur via direct contact exposure of PFAS-containing media and via ingestion of PFAS-containing tissue. There have been no on-site soil PFOS or PFOA detections that have exceeded the WDNR industrial direct contact residual contamination levels applicable to the FTC. Due to poor absorption of PFAS at typical groundwater and surface water pH levels, the potential for exposure to PFAS in groundwater and surface water via direct dermal contact is negligible (Health Canada 2019). WDNR analyzed deer tissue for PFAS during 2020 and subsequently issued a recommendation to avoid deer liver consumption from deer harvested within 5 miles of the FTC.

Ecological receptors may be exposed to PFAS via ingestion of PFAS-containing media. Fish tissue in ponds south of the FTC were analyzed for PFAS in the fall of 2020.

Data Gaps

Data gaps are identified in the **Site Investigation Work Plans**.

Stanton Street Facility CSM

A detailed report on the Stanton Street facility CSM was submitted to WDNR in July 2020 and most recently updated in the February 2024 Stanton Street Site Investigation Status Report (Arcadis). The Stanton Street facility CSM is summarized in previous submittals.

Key Physical Aspects of the Site

Shallow soils beneath the site, extending to at least the 4-foot depth range, consist of fill and/or sandy alluvium. The water table is approximately 1 to 5 feet below ground surface. Bedrock occurs approximately 35 feet below ground surface. Groundwater naturally flows towards the Menominee River. However, a barrier system was built on-site and groundwater pumps are operated within the barrier system to contain on-site shallow groundwater.

Sources of PFAS and Transport Mechanisms

Blending of fluorinated foams at the Stanton Street facility ceased in June 2024. Historically, PFAS-containing foams were blended at the Stanton Street facility; however, the raw PFAS ingredients were never produced at the facility and there were no stack emissions associated with this facility. No fire training exercises or demonstrations of Class B firefighting foam (such as AFFF) occurred at the Stanton Street facility. Potential PFAS releases are suspected to have been incidental occurrences related to historic facility handling of foams. There are no known aerial releases of PFAS at the Stanton Street facility. Transport of PFAS associated with historic activities is thought to occur via infiltration of PFAS through soil and overburden groundwater.

Receptors of Concern

There are no potable wells in the vicinity of the Stanton Street facility. A deed restriction at the site prohibits the use of groundwater as a drinking water source. Therefore, human exposure to PFAS in groundwater via ingestion is not a significant pathway. In 2019, WDNR collected surface water samples in the Menominee River upgradient and downgradient of the Stanton Street site; PFOS and PFOA were not detected above 1 ng/L in any sample, which is below the WDNR surface water quality guidelines for bodies of water that are used for drinking water purposes. In 2022, Tyco collected surface water samples in the Menominee River upgradient and downgradient of the Stanton Street site; PFOS and PFOA were below the WDNR surface water quality guidelines for bodies of water that are used for drinking water purposes.

Human exposure may also occur via direct contact exposure of PFAS-containing media and via ingestion of PFAS-containing tissue. There have been no on-site soil PFOS or PFOA detections that have exceeded the WDNR industrial direct contact residual contamination levels applicable to the Stanton Street facility. Due to poor absorption of PFAS at typical groundwater and surface water pH levels, the potential for exposure to PFAS in groundwater and surface water via direct dermal contact is negligible (Health Canada 2019). Consequently, dermal contact exposure to PFAS during excavation work when groundwater is encountered and during operation of the groundwater extraction system at the site is expected to be negligible. In addition, health and safety procedures are in place to protect workers from potential exposure to arsenic during on-site excavation activities. These procedures also protect workers from potential exposure to PFAS.

PFOS concentrations in fish tissue samples collected in 2012 in the Menominee River were below the “do not eat” threshold of the Great Lakes Consortium for Fish Consumption Advisories, of which Wisconsin is a member, of 200 nanograms per gram (ng/g).

Data Gaps

Data gaps will be identified in the **Site Investigation Work Plans**.

CSM for City of Marinette Biosolids Application Fields

History and Background

Tyco sampled private drinking water wells in the vicinity of property (fields) where biosolids were land-applied by the City of Marinette under oversight by the WDNR.

The City of Marinette WWTP has historically land-applied biosolids on privately owned farm fields. Biosolids land application activities conducted by the City of Marinette are permitted by the WDNR in accordance with Wisconsin Administrative Code Chapter NR 214.

In June 2018, the City of Marinette notified the WDNR of elevated PFAS concentrations present in influent wastewater received by the WWTP. In July 2018, the City of Marinette identified elevated PFAS concentrations in biosolids generated by the WWTP from 2017 and 2018. In July 2018, the City of Marinette tested lines from five wastewater zones that discharge into its WWTP and identified levels of PFAS in all five lines. Several farm fields have received biosolids from the City of Marinette and Town of Peshtigo WWTPs. The Marinette area contains numerous different industrial sites that are likely contributing sources of PFAS to the WWTP. As a result, there are multiple potential sources of PFAS that may have been present in the biosolids historically applied by the City of Marinette WWTP.

In September 2018, WDNR requested that the City of Marinette stop land application of biosolids. The WDNR identified 61 fields that received the City of Marinette biosolids land application from 1996 to 2018.

On July 3, 2019, WDNR requested that Tyco evaluate the impact of PFAS-containing land applied biosolids from the City of Marinette on private drinking water wells. WDNR identified 61 fields that received biosolids for land application from the City of Marinette between 1996 and 2018, some of which also received biosolids from the City of Peshtigo.

In March 2020, Tyco agreed to conduct one-time sampling of certain wells in the vicinity of the 61 fields identified by WDNR where biosolids were land applied under WDNR permits from the City of Marinette. Tyco made multiple contacts to 345 property owners in this area for private well testing and ultimately identified 203 parcels that used well water as a drinking water source. In this initial sampling effort, 183 wells were sampled. Following completion of the sampling program, WDNR and other private residents requested additional potable well sampling. Five additional owners requested sampling of their wells, all of which were sampled in 2021. In total, Tyco has sampled 188 potable wells in this study area to date. Of the 345 property owners contacted, 11 owners refused access to their property and nine were non-responsive after initially expressing interest in having their well sampled. Tyco offered bottled water to users of 27 of these wells that had potable well analytical results greater than the Wisconsin Department of Health Services recommended groundwater enforcement standard.

After receipt of WDNR correspondence dated September 14, 2021, Tyco proposed to expand bottled water service to any property within a revised 1,200-foot buffer area with a potable drinking water well that was not sampled during the one-time sampling event. This provides a broadly applicable protective measure to residents of this expanded area. In February 2025, WDHS recommended individual groundwater standards of 4 ng/L for PFOA and PFOS, 10 ng/L for PFHxS, PFNA, and HFPO-DA, and 2,000 ng/L for PFBS. Following the February 2025 WDHS recommendation, the WDNR Secretary and the Governor signed the WDNR scope statement and WDNR is in the early stages of rule development for enforcement standards for these six PFAS constituents. Tyco reviewed previous sampling results and issued bottled water offers to six properties with sampling results that were below previously proposed enforcement standards, but that are above the enforcement standards proposed in the current WDNR rulemaking for PFOA, PFOS, PFHxS, PFNA, HFPO-DA, and PFBS.

Current Understanding of PFAS Impacts

It is currently not well understood whether the land-applied biosolids historically applied to these fields have resulted in measurable PFAS impacts to those fields and, if present, whether those PFAS have migrated to groundwater. Tyco sampled private drinking water wells in the vicinity of fields where biosolids were land-applied by the City of Marinette under WDNR oversight and the results of those analyses were inconclusive in identifying biosolids as a source of PFAS in groundwater.

Receptors of Concern

Humans who may be exposed to PFAS via ingestion of PFAS-containing groundwater are the major receptors of concern in this investigation. Human exposure may also occur via direct contact exposure of PFAS-containing media.

Data Gaps

Potential PFAS sources to the biosolids are not currently understood or characterized. Other potential PFAS sources that may impact individual wells are not currently understood or characterized.

QAPP Worksheet #11 – Project/Data Quality Objectives

Worksheet #11 describes Data Quality Objectives (DQOs) using the USEPA seven-step DQO process (*Guidance on Systematic Planning Using the Data Quality Objectives Process*, USEPA QA/G-4, EPA/240/B-06/001, February 2006). The selected investigation design is presented within the **Site Investigation Work Plans** submitted to WDNR under separate cover.

Step 1: State the Problem
Tyco sells a variety of firefighting materials. Prior to June 2024, some of those firefighting materials included Class B foams such as AFFF that contained PFAS. Tyco has historically blended PFAS-containing foams at the Stanton Street facility and tested the foam at the FTC, as described in **Worksheet #10**. These historic activities have led to aqueous releases of PFAS to the ground and to the sanitary systems at these facilities. As discussed in **Worksheet #10**, in the past, both facilities discharged permitted industrial and laboratory wastes to the City of Marinette Wastewater Treatment Plant (WWTP), but that practice has ceased. Historic fluorinated and all non-fluorinated foam-containing wastewater from the FTC is currently treated by an onsite wastewater treatment system before being discharged under a permit to the Marinette WWTP. Previous site investigation activities and private well sampling related to the FTC (**Worksheet #1 & 2**) have established that PFAS, including PFOS and PFOA, have migrated in groundwater and via surface water ditches outside of the FTC property, towards the southern and eastern directions. While USEPA classifies PFAS as a category of "emerging contaminants" and proposed PFAS standards for regulated media continue to evolve USEPA has identified two PFAS, PFOA and PFOS, as "Hazardous Substances" for purposes of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In addition, USEPA has identified Maximum Contaminant Levels (MCLs) of 4 parts per trillion (ppt) for PFOA and PFOS, 10 ppt for PFHxS, PFNA, and HFPO-DA, and an MCL based on a hazard index for PFAS mixtures containing two or more of the following: PFHxS, PFNA, HFPO-DA, and PFBS under the Safe Drinking Water Act. [2],
Step 2: Identify the Goal of the Study
The overarching goal of the sampling activities is to protect human health and the environment by determining the nature and extent of PFAS impacts related to Tyco's activities in Marinette. Each sampling activity has specific goals, including delineating PFAS concentrations in groundwater, surface water, soil, sediment, and fish tissue; measuring PFAS concentrations in potable groundwater; evaluating the soil leaching to groundwater pathway; and evaluating performance of water treatment systems.

[2] In February 2025, WDHS recommended individual groundwater standards of 4 ng/L for PFOA and PFOS, 10 ng/L for PFHxS, PFNA, and HFPO-DA, and 2,000 ng/L for PFBS. Following the February 2025 WDHS recommendation, the WDNR Secretary and the Governor signed the WDNR scope statement and WDNR is in the early stages of rule development for these groundwater standards.

Step 3: Identify Information Inputs
The information needed to accomplish the goals of the sampling activities for this project are: • Site investigation data collected to date, including analytical data and data related to the assessment of hydrogeologic conditions. • Publicly available data on surface water and fish tissue PFAS concentrations. • New analytical data obtained from sampling media as described in the **Site Investigation Work Plans** submitted under separate cover. Parameters and analytical methods are identified in **Worksheets #19 and 30**. Field sample collection methods are summarized in **Worksheets #17 and 21**. • Observations made during the investigation. • Regional information on geology and hydrogeology. • Information on other potential sources of PFAS in the investigation areas.
Step 4: Define the Boundaries of the Sampling
The boundaries for sampling will be discussed in the **Site Investigation Work Plans** submitted under separate cover to WDNR. Previously submitted work plans are summarized in **Worksheet #1 & 2**. The media to be potentially sampled include surface water, groundwater, soil, sediment, wastewater, fish tissue, and potable groundwater. Laboratory methods are not yet widely available to analyze air for PFAS. Until such time as laboratory methods are well developed, sampling of air for PFAS is not being considered.
Step 5: Develop the Analytic Approach
The samples will be submitted for analysis to Eurofins, or SGS AXYS in the case of fish tissue samples. Analytical methods are described in **Worksheet #23**. **Worksheet #15-1 through #15-3** identify the laboratory's reporting limits (RLs) for PFAS. This QAPP governs the collection of several different types of media for analysis of PFAS and other analytes for several different purposes: • PFAS analytical data collected from private wells has and will be used to evaluate the need for drinking water treatment or an alternate water supply. Based on this data, Tyco has already replaced 100 private wells providing an alternate water source. If any of the **Table 2** values are exceeded in the potable water samples, drinking water treatment or an alternate water supply will be provided. The wells will be monitored thereafter, and the data will be used to assess the effectiveness of treatment, if relevant, and changing conditions in PFAS concentrations in the untreated water. • PFAS analytical data in groundwater, soil, sediment, surface water, and fish tissue will be used to refine the CSMs and define the needs of future investigation activities. If applicable, PFAS analytical data collected from air also would be used to refine the CSM. Laboratory methods are not yet widely available to analyze air for PFAS. Until such time as laboratory methods are well developed, sampling of air for PFAS is not being considered.

• PFAS analytical data from treatment systems, including the GETS, Ditch A and Ditch B treatment systems and on-site wastewater treatment system, will be used to operate, monitor, and maintain those treatment systems. • Non-PFAS analytical data will be used to refine the CSMs and operate, monitor, and maintain treatment systems, as relevant.
Step 6: Specify Performance or Acceptance Criteria
Controls on precision, reporting, and accuracy are provided in **Worksheets #12 and 28**. Field monitoring and detection equipment will be routinely calibrated, detailed in **Worksheet #22**, which confirms that equipment used is of the proper type, range, accuracy, and precision to provide data compatible with the specified requirements and desired results. The Data Usability Assessment process is described in **Worksheet #37**.
Step 7: Develop the Plan for Obtaining Data
The sampling designs are or will be specified within **the Site Investigations Work Plans** submitted under separate cover. Samples will be collected in accordance with the technical guidance instruction (TGI) and the standard operating procedure (SOP) documents included as **Appendix A** and listed in **Worksheet #21**.

Table 2: List of Compounds

Analyte	Wisconsin DHS Recommended Standards February 2025 (in Rulemaking/Not Yet Adopted) [(1)]	Units
PFOA	4	ng/L
PFOS	4	ng/L
PFBS	2,000	ng/L
PFHxS	10	ng/L
PFNA	10	ng/L
HPFO-DA	10	ng/L

Notes:

[1] In February 2025, WDHS recommended individual groundwater standards of 4 ng/L for PFOA and PFOS, 10 ng/L for PFHxS, PFNA, and HFPO-DA, and 2,000 ng/L for PFBS. Following the February 2025 WDHS recommendation, the WDNR Secretary and the Governor signed the WDNR scope statement and WDNR is in the early stages of rule development for these groundwater standards.

QAPP Worksheet #12 – Measurement Performance Criteria

To measure and control the quality of analyses, certain QA parameters, discussed below, are defined and utilized in data analysis activities.

Precision

Precision, which measures the reproducibility of data or measurements under specific conditions, is a quantitative measure of the variability of a group of data compared to their average value. Duplicate precision is stated in terms of relative percent difference (RPD). Measurement of precision is dependent upon sampling technique and analytical method.

For a pair of measurements, RPD will be calculated to assess precision, as presented below:

$$RPD(\%) = \frac{|D_1 - D_2|}{\left[\frac{(D_1 + D_2)}{2}\right]} \times 100$$

where: D_1 and D_2 = the two replicate values

For laboratory duplicate analyses, the RPD will meet the laboratory-specific limit. For organic and inorganic analyses, field duplicate RPD criteria are ≤ 30% for water samples and ≤ 50% for solid and tissue samples.

Accuracy/Bias

Accuracy measures the bias in a measurement system. Sources of error include the sampling process, field contamination, preservation, handling, shipping, sample matrix, sample preparation, and analysis technique. Analytical accuracy will be assessed through surrogate spike, matrix spike, laboratory control and/or quality check samples, where applicable. In general, accuracy is measured in terms of percent recovery (%R):

$$\%R = \frac{(SSR - SR)}{SA} \times 100$$

where:

SSR = spike sample result

SR = sample result

SA = spike added to spiking matrix

Refer to **Worksheets #12 and 28** for the laboratory analytical method accuracy requirements.

Representativeness

Representativeness is the degree to which sampling data accurately and precisely represent site conditions and is dependent on sampling and analytical variability and the variability of environmental media at the site. Actions have been designed to assess the presence of chemical constituents at the time of sampling. The **Site Investigation Work Plans** present the rationale for sample quantities and location. This QAPP presents field sampling and laboratory analytical methodologies. Use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data.

Completeness

Completeness is a measure of the amount of usable data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is expected that the laboratories used for this project will provide data that meet the QC acceptance criteria for 90%, or more, of all samples analyzed. Following completion of the analytical testing for a sampling mobilization location, the percent completeness will be calculated by the following equation:

$$COMPLETENESS\ (\%) = \frac{number\ of\ usable\ data\ points}{number\ of\ data\ points\ planned\ to\ be\ collected}\ x\ 100$$

The data validation process will be used to determine the quality and quantity of usable analytical data generated.

The completeness acceptance criterion for samples collected in the field will be 90% of the quantity of samples planned for collection. Corrective action may be implemented to re-collect samples where necessary and possible (e.g., modifying a planned sample location, addressing sample jars broken during shipment). Laboratory notification of sample receipt and conditions will be used to determine, as soon as possible, whether any problems during sample shipment would necessitate recollection of samples.

Comparability

Comparability is the degree of confidence with which one data set can be compared to another. Comparability will be maintained through consistent use of the sampling and analytical methodologies set forth in this QAPP, established QA/QC procedures, and use of appropriately trained personnel.

Desired Method Sensitivity

Sensitivity is a quantitative measurement to determine whether the analytical laboratory's procedures/methodologies and their associated detection limits can satisfy the project requirements. RLs are updated annually by the laboratory. The current RLs for the analytical laboratories are presented in **Worksheet #15**.

QAPP Worksheet #12-1 – Measurement Performance Criteria Table – PFAS (Water – Potable)

Matrix	**Potable Water**				
Analytical Group	**PFAS**				
Concentration Level	**All**				
Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA method 537.1 Per laboratory SOP L1	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Accuracy/Bias Contamination	< RL	Blanks (field, equipment, method)	S&A
		Analytical Accuracy/Bias (laboratory)	Added just prior to analysis. Peak area counts for all internal standards in all injections must be within ± 50% of the average peak area calculated during the initial calibration and 70% to 140% from the most recent continuing calibration verification (CCV). Peak areas must be within ± 50% of the average peak area calculated during the initial calibration and 70% to 140% from the most recent CCV.	Internal standard analytes	A
		Analytical Accuracy/Bias (laboratory)	%R 70 to 130%	Laboratory control sample (LCS) and Laboratory control sample duplicate (LCSD)	A
		Analytical Accuracy/Bias (matrix interference)	%R 70 to 130%	Matrix spike (MS) and Matrix spike duplicate (MSD)	A
		Analytical Precision (laboratory)	RPD $\leq$ 30%	LCSD and MSD	A
		Sensitivity	RLs are below PSLs	RLs	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Notes:

PSL = Project Screening Levels

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA method and the laboratory SOP.

QAPP Worksheet #12-2 – Measurement Performance Criteria Table – PFAS (Potable and Non-Potable Water)

Matrix	Non-Potable Water				
Analytical Group	PFAS				
Concentration Level	All				
Sampling Procedure	**Analytical Method/SOP**	**DQI**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	Modified USEPA Method 537 using Isotope Dilution Per laboratory SOP L2	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL	Field duplicate	S&A
		Accuracy/Bias Contamination	< ½ RL or <1/10 sample concentration, whichever is higher	Blanks (field, equipment, method)	S&A
		Accuracy/Bias	%R, 25-150%	Extracted internal standard analytes[2]	A
		Accuracy/Bias	%R, 60 to 135% medium and high range %R, 50 to 150% low range (less than 2x RL)	LCS and LCSD	A
		Precision — lab	Area response -50 to +50%	Non-extracted internal standard	A
		Accuracy/Bias	%R, See Appendix B	MS and MSD	A
		Sensitivity	RLs are below PSLs	RLs	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Notes:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA method, laboratory SOP, and Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations (EA-19-0001), Version 12, December 2019.

[2] = FOSA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE: %R, 10-150% or laboratory statistical limits.

QAPP Worksheet #12-3 – Measurement Performance Criteria Table – PFAS (Potable and Non-potable Water)

Matrix	**Potable and Non-Potable Water**				
Analytical Group	**PFAS**				
Concentration Level	**All**				
Sampling Procedure	**Analytical Method/SOP**	**DQI**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA Method 1633/1633A Per laboratory SOP L46	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL	Field duplicate	S&A
		Accuracy/Bias Contamination	No target analytes > ½ RL	Blanks (field, equipment, method)	S&A
		Accuracy/Bias	Percent recovery (%R) within EPA Method 1633 Tables 6 and 8 limits	Extracted internal standard analytes[2]	A
		Accuracy/Bias	Laboratory Control Samples (LCS) and Low-Level Laboratory Control Samples (LLLCS) (EPA Method 1633 equivalent to Ongoing Precision and Recovery Standard and Low-Level Ongoing Precision and Recovery Standard)	LCS and LCSD	A
		Precision — lab	Area response -50 to +50%	Non-extracted internal standard	A
		Accuracy/Bias	%R within EPA Method 1633 Tables 5 and 7 limits Relative Percent Difference (RPD) ≤ 30%	MS and MSD	A
		Sensitivity	RLs are ≤ to PSLs	RLs	A
		Completeness	95%	Data completeness	S&A

QAPP Worksheet #12-4 – Measurement Performance Criteria Table – PFAS (Solids and Fish Tissue)

Matrix	Solids and Fish Tissue
Analytical Group	PFAS
Concentration Level	All

Sampling Procedure	Analytical Method/SOP	DQI	Measurement Performance Criteria[1]	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See Sampling SOPs in Appendix A	Solids: Modified USEPA Method 537 using Isotope Dilution Per laboratory SOP L2 (Solids) and L42 (Fish tissue)	Precision — Overall	RPD < 50% if results > 5x the RL. Difference < ±3x the RL, if one or both sample results are less than 5x the RL	Field duplicate[2]	S&A
		Precision — Overall	RPD ≤ 40% for results ≥ 5 times RL RPD ≤ 100% for results < 5 times RL	Laboratory duplicate[5]	A
		Accuracy/Bias Contamination	< ½ RL or <1/10 sample concentration, whichever is higher	Blanks (field, equipment, method)	S&A
		Accuracy/Bias	%R, 25-150%	Extracted internal standard analytes[3]	A
		Accuracy/Bias	%R, 60 to 135% medium and high range %R, 50 to 150% low range (less than 2x RL)	LCS and LCSD[5]	A
		Accuracy/Bias	%R, see table *QC Specifications for Aqueous, Solid, AFFF, Tissue and Blood/Serum Samples: Surrogate Standard Recoveries, OPR and Samples* in L42	Extracted internal standard analytes[4]	A
		Accuracy/Bias	%R, see table *QC Specification Table for Aqueous, Solid, AFFF and Tissue Samples: Procedural Blank Levels and OPR Recovery Ranges* in L42	LCS and LCSD[5]	A
		Precision — lab	Area response -50 to +50%	Injection Internal standard analytes	A

Matrix	Solids and Fish Tissue				
Analytical Group	PFAS				
Concentration Level	All				
Sampling Procedure	**Analytical Method/SOP**	**DQI**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
		Precision — lab[5]	The ratio of the primary to secondary product ion responses in the total for branched and linear isomers must fall within ±50% of the same ratio observed in the mid-point initial calibration standard (CAL E). The ratio requirement does not apply where suitable (not detectable or inadequate S/N) secondary transitions are unavailable.	Injection Internal standard analytes (recovery standards)[3]	A
		Accuracy/Bias	%R, See Appendix B	MS and MSD[3]	A
		Accuracy/Bias	%R, ≤30%. Professional judgement applies due to the limit of applicability caused by sample background levels[5]	MS and MSD[1]	A
		Other	See table *QC Specification Table: Other Parameters* in L42[5]	Other	A

Notes:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA method, laboratory SOP, and Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations (EA-19-0001), Version 12, December 2019.

[2] = Field duplicates do not apply to fish tissue samples.

[3] = FOSA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE: %R, 10-150% or laboratory statistical limits (WDNR 2019).

[4] = For fish tissue the recoveries are expected to be within 60-135% with the following exceptions: for PFHxDA, PFODA, and NMeFOSA, the recoveries are expected to be within 50-135%; for PFDS, PFDoS, and 4:2 FTS, the recoveries are expected to be within 40-135% (WDNR 2019).

[5] = For fish analysis at SGS AXYS.

QAPP Worksheet #12-5 – Measurement Performance Criteria Table (Volatile Organic Compounds in Water)

Matrix	Water				
Analytical Group	Volatile Organic Compounds (VOCs)				
Concentration Level	Low				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA 624/SW-846 8260B Per laboratory SOPs L3/L4	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate[2]	S&A
		Accuracy/ Precision	Recovery and RPD per laboratory control limits for individual compounds	MS/MSD	A
		Accuracy	70-130% or per lab control limits	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Accuracy/Bias	% Relative abundance, see analytical SOP	Instrument performance check: bromofluorobenzene (BFB)	A
		Precision	Area response and retention times, see analytical method	Internal standard	A
		Accuracy/Bias	See analytical method	Surrogate	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Notes:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA and SW846 methods, and the laboratory SOPs.

QAPP Worksheet #12-6 – Measurement Performance Criteria Table (Volatile Organic Compounds in Soil)

Matrix	**Solids**				
Analytical Group	**VOCs**				
Concentration Level	**Low**				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	SW-846 8260B Per laboratory SOPs L5/L6	Precision — Overall	RPD < 50% if results > 5x the RL. Difference < ± 3x the RL, if one or both sample results are less than 5x the RL.	Field duplicate[2]	S&A
		Accuracy	Recoveries per USEPA and SW846 Methods and the criteria in the laboratory SOP	Surrogates	A
		Precision	Area response and retention times, see analytical method	Internal standard	A
		Accuracy/ Precision	Recovery and RPD per laboratory control limits for individual compounds	MS/MSD	A
		Accuracy/Bias	See analytical method	Surrogate	A
		Accuracy	70% to 130% or per lab control limits	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Sensitivity	Low enough to support the screening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA and SW846 methods, and the laboratory SOPs.

QAPP Worksheet #12-7 – Measurement Performance Criteria Table (Semi-Volatile Organic Compounds and Polyaromatic Hydrocarbons in Water)

Matrix	Water
Analytical Group	Semi-Volatile Organic Compounds (SVOCs) and Polyaromatic Hydrocarbons (PAHs)
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	DQIs	Measurement Performance Criteria[1]	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See Sampling SOPs in Appendix A	USEPA 625/SW-846 8270D Per laboratory SOP L5/L6	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Accuracy	Recoveries per USEPA and SW-846 Methods and laboratory SOP criteria (none less than 10%)	Surrogates	A
		Precision	Area response and retention times, see analytical method	Internal standard	A
		Accuracy/ Precision	Recovery and RPD per laboratory control limits for individual compounds	MS/MSD	A
		Accuracy/Bias	See analytical method	Surrogate	A
		Accuracy	70% to 130% or per lab control limits	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA and SW846 methods, and the laboratory SOPs.

QAPP Worksheet #12-8 – Measurement Performance Criteria Table (Semi-Volatile Organic Compounds in Soil)

Matrix	Soil				
Analytical Group	SVOCs and PAHs				
Concentration Level	Low				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	SW-846 8270D Per laboratory SOP L5/L6	Precision — Overall	RPD < 50% if results > 5x the RL. Difference < ± 3x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Accuracy	Recoveries per USEPA and SW-846 Methods and laboratory SOP criteria (none less than 10%)	Surrogates	A
		Precision	Area response and retention times, see analytical method	Internal standard	A
		Accuracy/ Precision	Recovery and RPD per laboratory control limits for individual compounds	MS/MSD	A
		Accuracy	Per lab control limits	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA and SW846 methods, and the laboratory SOPs.

QAPP Worksheet #12-9 – Measurement Performance Criteria Table (1,4-Dioxane in Potable Water)

Matrix	Water				
Analytical Group	1,4-Dioxane				
Concentration Level	Low				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA 522 Per laboratory SOP L10	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Accuracy	Recoveries per USEPA method	Surrogates	A
		Precision	Area response and retention times, see analytical method	Internal standard	A
		Accuracy/ Precision	Recovery and RPD per laboratory control limits for individual compounds	MS/MSD	A
		Accuracy	Per lab control limits	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:
[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA and the laboratory SOP.

QAPP Worksheet #12-10 – Measurement Performance Criteria Table (Pesticides in Potable Water)

Matrix	Water				
Analytical Group	Pesticides				
Concentration Level	Low				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA 525.2/505 Per laboratory SOPs L11/L12	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Accuracy	<40% RPD (applies to method 525.2 only)	Confirmatory column	A
		Accuracy	Recoveries per USEPA methods and the criteria in the laboratory SOP	Surrogates	A
		Precision	Area response and retention times, see analytical SOP (applies to method 525.2 only)	Internal standard	A
		Accuracy/ Precision	Recovery and RPD per laboratory control limits for individual compounds	MS/MSD	A
		Accuracy	Recoveries per lab control limits	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:
[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA methods and the laboratory SOPs.

QAPP Worksheet #12-11 – Measurement Performance Criteria Table (Total and Dissolved Metals – Water)

Matrix	Water
Analytical Group	Metals
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	DQIs	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See Sampling SOPs in Appendix A	USEPA 200.8 (potable) / SW-846 6020A (non-potable) Per laboratory SOPs L13/L14/L15/L16/L17/L18	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Sensitivity	Less than the RLs	Method blank	A
		Precision	% Relative Intensity (RI) (method 200.8 = 60-125 and method 6020A = 30-120)	Internal standard	A
		Accuracy	Recovery 80% to 120%	Interference check sample	A
		Accuracy	Recovery ± 20% or within laboratory control limits	LCS	A
		Accuracy/ Precision	Recovery ± 25%; RPD ≤ 20%	MS/MSD	A
		Precision	RPD < 20% for duplicate values greater than or equal to 5 times the RL	Laboratory Duplicate	A
		Accuracy	Recovery ± 25%	Post-digestion spike	A
		Precision	1:5 dilution must agree within ± 10% of original detemination. Only applicable for samples with concentrations > 50-times RL prior to dilution	Serial dilution	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

QAPP Worksheet #12-12 – Measurement Performance Criteria Table (Total and Dissolved Mercury in Water)

Matrix	Water
Analytical Group	Mercury
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	DQIs	Measurement Performance Criteria[1]	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See Sampling SOPs in Appendix A	USEPA 245.1/SW-846 7470A (non-potable) Per laboratory SOP L19	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Precision	RPD < 20% for duplicate values greater than or equal to 5 times the RL	Laboratory Duplicate	A
		Accuracy/ Precision	Recovery ± 25%; RPD ≤ 20%	MS/MSD	A
		Accuracy	Recovery ± 20% (SW7470A) Recovery ± 15% (USEPA 245.1)	LCS	A
		Sensitivity	Less than the RLs	Method blank	A
		Sensitivity	Low enough to support the sceening levels	Method detection limits	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:
[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable SW846 methods and the laboratory SOPs.

QAPP Worksheet #12-13 – Measurement Performance Criteria Table (General Chemistry Parameters for Water)

Matrix	Water				
Analytical Group	**Wet Chemistry**				
Concentration Level	**All**				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA Method 1664B and Lloyd Kahn; SW-846 methods 1010A, 6860, 7196A, 9056A, 9060A; and Standard Methods SM 2320B, 4500-NHG-G, 5210B, 5220C, 4500P-E, 4500-H-B, 2540C, 2540D, and 2540B Per laboratory SOPs L17 through L38	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Precision	RPD < 20% for duplicate values greater than or equal to 5 times the RL	Laboratory Duplicate	A
		Accuracy/Bias Contamination	< RL	Blanks (field, equipment, calibration, method)	A
		Accuracy/ Bias	%R: 75% to 125%	MS (and MSD)	A
		Precision	RPD <20%	Laboratory duplicate or MS/MSD	A
		Accuracy/ Bias	%R: 80% to 120%	LCS	S&A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable Standard Methods and SW-846 methods, and the laboratory SOPs.

QAPP Worksheet #12-14 – Measurement Performance Criteria Table (General Chemistry Parameters for Soil and Sediment)

Matrix	Soil and Sediment				
Analytical Group	Wet Chemistry				
Concentration Level	All				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria[1]**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See Sampling SOPs in Appendix A	USEPA Method Lloyd Kahn ASTM D2216 Percent moisture L39 Per laboratory SOPs L41	Precision — Overall	RPD < 50% if results > 5x the RL. Difference < ± 3x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Precision	RPD < 35% for duplicate values greater than or equal to 5 times the RL	Laboratory Duplicate	A
		Accuracy/Bias Contamination	< RL	Blanks (field, equipment, calibration, method)	A
		Accuracy/ Bias	%R: 75% to 125%	MS (and MSD)	A
		Precision	RPD <35%	Laboratory duplicate or MS/MSD	A
		Accuracy/ Bias	%R: 80% to 120% or per lab control limits	LCS	S&A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable Standard Methods and SW-846 methods, and the laboratory SOPs.

QAPP Worksheet #12-15 – Measurement Performance Criteria Table – SPLP Extract PFAS (Aqueous)

Matrix	Water
Analytical Group	Synthetic Precipitation Leaching Procedure (SPLP) PFAS
Concentration Level	All

Sampling Procedure	Analytical Method/SOP	DQI	Measurement Performance Criteria[1]	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See Sampling SOPs in Appendix A	Modified USEPA Method 537 using Isotope Dilution Per laboratory SOPs L2/L40	Precision — Overall	RPD < 30% if results > 5x the RL. Difference < ±2x the RL, if one or both sample results are less than 5x the RL.	Field duplicate	S&A
		Accuracy/Bias Contamination	< ½ RL or <1/10 sample concentration, whichever is higher	Blanks (equipment, method)	S&A
		Accuracy/Bias	%R, 25-150%	Extracted internal standard analytes[2]	A
		Accuracy/Bias	%R, 60 to 135% medium and high range %R, 50 to 150% low range (less than 2x RL)	LCS and LCSD	A
		Precision — lab	Area response -50% to +50%	Injection Internal standard analyte	A
		Sensitivity	RLs are below PSLs	RLs	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

Note:

[1] = The assigned laboratory must perform and meet all the measurement performance criteria that assess the analytical DQIs as specified in the applicable USEPA and USEPA and SW-846 methods, laboratory SOPs, and the Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations (EA-19-0001), Version 12, December 2019.

QAPP Worksheet #12-16 – Measurement Performance Criteria – Gamma Spectroscopy Parameters (Soil/Solid)

Matrix	Soils/Solids				
Analytical Group	Gamma Spectroscopy Parameters (Ra-226 and Ra-228)				
Concentration Level	Low				
Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See FSP in **Appendix A** and Sampling SOPs in **Appendix D**	EPA 901.1 Modified or equivalent gamma spectroscopy procedure Per laboratory SOP L43/L44	Precision	RPD of ±35% for samples with concentrations >5 times the minimum detectable activity (MDA) or RPD of ±2 times MDA for samples with concentrations <5 times MDA	Laboratory duplicates Field duplicates	A
		Sensitivty	Analytes <MDA	Method blank	A
		Accuracy	Must be done at least annually; see Worksheet #24 for acceptance criteria	Instrument calibration	A
		Accuracy	Detector resolution: within +0.4 full width at half maximum (FWHM) of the value during the initial calibration; Energy: within +1 kiloelectronvolt (keV) of the known energies; Efficiency: 90-110% of the efficiency determined during the initial calibration	Calibration verification	A
		Accuracy/ Sensitivity	+3 standard deviations of the initial background count rates	Detector background	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

QAPP Worksheet #12-17 – Measurement Performance Criteria – Ra-226 (Aqueous)

Matrix	Water				
Analytical Group	Ra-226				
Concentration Level	Low				
Sampling Procedure	**Analytical Method/SOP**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
See FSP in **Appendix A** and Sampling SOPs **in Appendix D**	EPA 903.0 or equivalent Per laboratory SOP L43/L44	Precision	≤ 40% RPD. The RER should be <1	Laboratory/Field Duplicate	A
		Accuracy	Per laboratory control chart ±3 sigma limit	Instrument calibration check	A
		Accuracy	Per laboratory control chart ±3 sigma limit	Instrument background	A
		Accuracy	Per laboratory control chart ±3 sigma limit	MS	A
		Accuracy	Recovery: 25-150%	Chemical recovery	A
		Accuracy/ Sensitivity	(Result – Error) ≤ Sample Detection Limit	Preparation blank	A
		Accuracy	Per laboratory control chart ±3 sigma limit	LCS	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

QAPP Worksheet #12-18 – Measurement Performance Criteria – Ra-228 (Aqueous)

Matrix	Water
Analytical Group	Ra-228
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	DQIs	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See FSP in **Appendix A** and Sampling SOPs in **Appendix D**	EPA 904.0 or equivalent Per laboratory SOP L43/L44	Precision	≤ 40% RPD or ≤ 1 RER	Laboratory/Field Duplicate	A
		Accuracy	Per laboratory control chart ±3 sigma limit	Instrument calibration check	A
		Accuracy	Per laboratory control chart ±3 sigma limit	MS	A
		Accuracy	Recovery: 40-120%	Chemical recovery	A
		Accuracy/ Sensitivity	(Result – Error) ≤ Sample Detection Limit	Preparation blank	A
		Accuracy	Per laboratory control chart ±3 sigma limit	LCS	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

QAPP Worksheet #12-19 – Measurement Performance Criteria (Gross Alpha/Beta in Water)

Matrix	Water
Analytical Group	Gross Alpha/Beta
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	DQIs	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)
See FSP in **Appendix A** and Sampling SOPs in **Appendix D**	EPA 900.0 or equivalent Per laboratory SOP L45	Precision	≤ 1.0 RER or ≤ 40% RPD	Laboratory duplicate	A
		Accuracy	Per laboratory control chart ±3 sigma limit	Instrument calibration standard	A
		Accuracy	Per laboratory control chart ±3 sigma limit	Instrument calibration blank	A
		Accuracy	Recovery 80-120%	LCS	A
		Accuracy/ Sensitivity	(Result – Error) ≤ Sample Detection Limit	Preparation blank	A
		Accuracy	Recovery 70-130%	MS	A
		Completeness	>90% sample collection, >90% laboratory analysis	Data completeness	S&A

QAPP Worksheet #13 – Secondary Data Uses and Limitations

Data Type	Source	Data Uses Relative to Current Project	Factors Affecting the Reliability of Data and Limitations on Data Use
Aerial Imagery	ESRI, ArcGIS Online Aerial Imagery	Provided georeferenced aerial photos for figure backdrops.	There are no known limitations on aerial imagery.
Previous PFAS Site Investigations	Previous PFAS site investigations and data collected by Tyco See **Worksheet #1 & 2**.	Helped define the existing CSM and guide upcoming Work Plans.	The PFAS analyte list has varied by phase of project, year of data collection, and media type. It has generally included more compounds as time has gone on. Comparison to historical data is not possible for some compounds and/or low-level sample results due to the changing analyte list and changing laboratory reporting limits.
Previous non-PFAS Site Investigations	Previous site investigations performed by Tyco	Provided geology and hydrogeology information, historical site usage, historical non-PFAS contaminant identification and concentrations, and remedial actions.	History and use information were focused on non-PFAS chemicals.
Tyco Personnel Interviews	Various	Provided aspects of site history relevant to these investigation activities that are not covered in previous Site Investigation Reports.	Some relevant staff have left Tyco due to retirement and normal job turnover and may not be available to answer questions.
Zoning and Land Use	Marinette County Geographic Information System	Letters were sent to all improved and unimproved parcels and landowners with potential potable wells were identified; developed soil leaching to groundwater screening levels based on zoning.	Parcel improvements or lack thereof indicated by GIS do not necessarily correlate to presence of a potable well on the parcel. Presence of potable wells was confirmed through letters, phone calls and other outreach. Locations of potable wells were verified in the field. Some property owners have been unresponsive to inquiries.
Meteorology Data	Natural Resources Conservation Service Agricultural Applied Climate Information System, National Oceanic and Atmospheric Administration (NOAA)	Meteorology data used for remediation system design and CSM.	There are no known limitations on meteorology data.

Data Type	Source	Data Uses Relative to Current Project	Factors Affecting the Reliability of Data and Limitations on Data Use
Natural Resources	USEPA, Natural Resource Conservation Service, Omernik et al. 2008, Wisconsin Wetlands Inventory, WDNR, Wisconsin Natural Heritage Inventory	Data used for CSM and permitting.	Some of the information is provided on a large regional scale and may not represent site-specific conditions.
Cultural Resources	Wisconsin Historical Society Wisconsin Historic Preservation Database	Data used for CSM and permitting.	Some of the information is provided on a large regional scale and may not represent site-specific conditions.
Geology	U.S. Geological Survey	Data used for CSM.	Some of the information is provided on a large regional scale and may not represent site-specific conditions.
Topography	ESRI LiDAR	Data used for CSM.	Some of the information is provided on a large regional scale and resolution may not be sufficient for site evaluation.
Surface Water Data	WDNR, MEGLE, City of Marinette	Data used for CSM.	Analytical methods and analyte lists vary.
Well Information	WDNR Well Records Database and Well Driller Viewer	Identified landowners with potential potable wells. Data used for CSM.	Well locations are sometimes by quarter section rather than specific coordinates; depth to screen, length of screen, and depth of well are sometimes not provided; soil description is typically performed by driller and may not be sufficiently accurate for site use.
Fish Tissue Data	USEPA, WDNR	Data used for CSM.	Fish species collected vary; type of fish tissue analyzed varies; analytical methods and analyte lists vary.
Green Bay Water Elevation	NOAA	Data used for CSM.	There are no known limitations on meteorology data.
Green Bay Hydrodynamics	WDNR, NOAA, Gottlieb 1992, Bravo et al. 2017, Beletsky and Schwab 2001	Data used for CSM.	Some of the information is provided on a large regional scale and resolution may not be sufficient for site evaluation.

QAPP Worksheet #14 & 16 – Project Tasks and Schedule[1]

Activities	Responsible Party	Anticipated Date(s) of Initiation	Anticipated Date of Completion	Deliverable	Estimated Deliverable Due Date
Quarterly summary of activities completed, data collected, issues, corrective actions, and Tyco/WDNR correspondence for the quarter; and planned activities for the upcoming quarter	Arcadis	Ongoing	Ongoing	Quarterly Progress Reports	Quarterly on January 15, April 15, July 15, and October 15
Submission of new private well and investigation data to WDNR and notification letters to private property owners, if applicable.	Arcadis	Ongoing	Ongoing	Final data report to WDNR, notification letters to private property owners, if applicable.	Within 10 business days of receipt of final data report
EQuIS and GIS updates	Arcadis	Ongoing	Ongoing	Electronic database and shapefile submission of analytical data and sample locations from current investigation.	Monthly
Development of monthly Wisconsin Pollutant Discharge Elimination System (WPDES) Reports	Arcadis	Monthly	Monthly	WPDES Report	21st day of each month
Comparison of project data against QA/QC requirements	Arcadis	Ongoing	Ongoing	Data Validation Reports	Ongoing
Data review	Arcadis	Ongoing	Ongoing	Data Validation Report	See Notes [3,4,5]
Summary of Ditch A monitoring	Arcadis	Ongoing	Semi-Annually in February and August	Ditch A Semi-Annual Monitoring Report	Semi-Annually in February and August
Summary of Ditch B monitoring	Arcadis	Ongoing	Semi-Annually in February and August	Ditch B Semi-Annual Monitoring Report	Semi-Annually in February and August

Activities	Responsible Party	Anticipated Date(s) of Initiation	Anticipated Date of Completion	Deliverable	Estimated Deliverable Due Date
Revised Long-Term Potable Well Sampling Plan (RLTPWSP)	Arcadis	Ongoing	Annually in October	Updated RLTPWSP	Annually by October 1
FTC 2022 Site Investigation Activities	Arcadis	May 2022	November 2022	Site Investigation Summary Report	60 days after receipt of final data report
Stanton Street 2022 Site Investigation Activities	Arcadis	July 2022	November 2022	Site Investigation Summary Report	60 days after receipt of final data report

Notes:

[1] = This is an ongoing project. The detailed project schedule is maintained by WDNR, Tyco, and Arcadis Investigative Team PM and is updated as needed. An up-to-date copy of the Project Schedule will be available to the project team members.

[2] = The site investigation activities consist of drilling hydraulic profile borings, monitoring well installation, groundwater sampling, and hydraulic testing.

[3] = Residential well (e.g., POET/private well/biosolids) sampling: Stage 2 data review will be conducted within 10 days of final data receipt and Stage 4 data review will be conducted within 60 days from final data receipt or as requested at time of sampling.

[4] = Ditch A and Ditch B treatment systems: Samples collected during a calendar month will be subjected to Stage 2 data review prior submittal to WDNR the following month for the WDNR monthly submittal requirement.

[5] = Additional sampling (e.g., wastewater, Stanton Street investigations): Stage 2 data review will be conducted withing 30 days from time of final receipt or as requested at time of sampling.

QAPP Worksheet #15-1 – Reference Limits and Evaluation (Chemical Analysis – Aqueous)

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Aqueous							
PFAS (USEPA Method Version 537.1) (14 Analytes)							
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	ng/L				0.50	2.0
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	ng/L				0.50	2.0
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L			2,000	0.50	2.0
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L				0.50	2.0
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L				0.50	2.0
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L				0.50	2.0
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/L			10	0.50	2.0
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L				0.50	2.0
Perfluorononanoic acid (PFNA)	375-95-1	ng/L			10	0.50	2.0
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ng/L			4	0.50	2.0
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L			4	0.50	2.0
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ng/L				0.50	2.0
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ng/L				0.50	2.0
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/L				0.50	2.0
PFAS Modified USEPA Method 537 (36 Analytes – WDNR List)							
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L				2.4	5.0
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L				0.49	2.0
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L				0.58	2.0

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L				0.25	2.0
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L			4	0.85	2.0
Perfluorononanoic acid (PFNA)	375-95-1	ng/L			10	0.27	2.0
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L				0.31	2.0
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/L				1.1	2.0
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L				0.55	2.0
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ng/L				1.3	2.0
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ng/L				0.73	2.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	ng/L				0.89	2.0
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	ng/L				0.94	2.0
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L			2,000	0.20	2.0
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ng/L				0.30	2.0
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/L			10	0.57	2.0
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	ng/L				0.19	2.0
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ng/L			4	0.54	2.0
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ng/L				0.37	2.0
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ng/L				0.32	2.0
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	ng/L				0.97	2.0
4:2 fluorotelomer sulfonate (4:2 FTS)	757124-72-4	ng/L				0.24	2
6:2 FTS fluorotelomer sulfonate (6:2 FTS)	27619-97-2	ng/L				2.5	5
8:2 FTS fluorotelomer sulfonate (8:2 FTS)	39108-34-4	ng/L				0.46	2.0
10:2 fluorotelomer sulfonate (10:2 FTS)	120226-60-0	ng/L				0.67	2.0
Perfluorooctanesulfonamide (FOSA)	754-91-6	ng/L				0.98	2.0
N-methylperfluorooctanesulfonamide (NMeFOSA)	31506-32-8	ng/L				0.43	2.0

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
N-ethylperfluorooctanesulfonamide (NEtFOSA)	4151-50-2	ng/L				0.87	2.0
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	ng/L				1.2	5
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	ng/L				1.3	5
N-methylperfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	ng/L				1.40	4.0
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	ng/L				0.85	2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	ng/L			10	1.50	4.0
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	958445-44-8	ng/L				0.18	2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	ng/L				0.24	2.0
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9	ng/L				0.32	2.0
PFAS USEPA Method 1633/1633A (40 Analytes – WDNR List)							
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L				0.373	4.0
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L				0.232	2.0
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L				0.269	2.0
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L				0.346	2.0
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L			4	0.391	2.0
Perfluorononanoic acid (PFNA)	375-95-1	ng/L			10	0.453	2.0
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L				0.441	2.0
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/L				0.226	2.0

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L				0.554	2.0
Perfluorotridecanoic acid (PFTriA)	72629-94-8	ng/L				0.576	2.0
Perfluorotetradecanoic acid (PFTeA)	376-06-7	ng/L				0.808	2.0
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L			2,000	0.279	2.0
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ng/L				0.213	2.0
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/L			10	0.245	2.0
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	ng/L				0.175	2.0
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ng/L			4	0.277	2.0
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ng/L				0.311	2.0
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ng/L				0.310	2.0
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	ng/L				0.529	2.0
4:2 fluorotelomer sulfonate (4:2 FTS)	757124-72-4	ng/L				0.437	4.0
6:2 FTS fluorotelomer sulfonate (6:2 FTS)	27619-97-2	ng/L				0.405	4.0
8:2 FTS fluorotelomer sulfonate (8:2 FTS)	39108-34-4	ng/L				0.896	4.0
10:2 fluorotelomer sulfonate (10:2 FTS)	120226-60-0	ng/L				NA	NA
Perfluorooctanesulfonamide (FOSA)	754-91-6	ng/L				0.225	2.0
N-methylperfluorooctanesulfonamide (NMeFOSA)	31506-32-8	ng/L				0.385	2.0
N-ethylperfluorooctanesulfonamide (NEtFOSA)	4151-50-2	ng/L				0.445	2.0
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	ng/L				0.350	2.0
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	ng/L				0.440	2.0
N-methylperfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	ng/L				2.28	10

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	ng/L				2.43	10
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	ng/L			10	0.390	1.5
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	958445-44-8	ng/L				0.400	2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	ng/L				0.579	2.0
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9	ng/L				0.297	2.0
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	ng/L				0.190	2.0
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	ng/L				0.258	2.0
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	ng/L				0.249	2.0
3-Perfluoropropylpropanoic acid (3:3 FTCA)	356-02-5	ng/L				0.719	4.0
3-Perfluoropentylpropanoic acid (5:3 FTCA)	914637-49-3	ng/L				1.72	10
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	812-70-4	ng/L				1.24	10
VOCs (SW-846 8260B)							
1,1,1,2-Tetrachloroethane	630-20-6	µg/L		70		0.46	1.0
1,1,1-Trichloroethane	71-55-6	µg/L	200	200		0.38	1.0
1,1,2,2-Tetrachloroethane	79-34-5	µg/L		0.2		0.40	1.0
1,1,2-Trichloroethane	79-00-5	µg/L	5	5		0.35	1.0
1,1-Dichloroethane	75-34-3	µg/L		850		0.41	1.0
1,1-Dichloroethene	75-35-4	µg/L	7	7		0.39	1.0
1,1-Dichloropropene	563-58-6	µg/L				0.30	1.0

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
1,2,3-Trichlorobenzene	87-61-6	µg/L				0.46	1.0
1,2,3-Trichloropropane	96-18-4	µg/L		60		0.41	2.0
1,2,4-Trichlorobenzene	120-82-1	µg/L	70	70		0.34	1.0
1,2,4-Trimethylbenzene	95-63-6	µg/L		480		0.36	1.0
1,2-Dibromo-3-chloropropane	96-12-8	µg/L	0.2	0.2		1.99	5.0
1,2-Dibromoethane	106-93-4	µg/L	0.05	0.05		0.39	1.0
1,2-Dichlorobenzene	95-50-1	µg/L	600	600		0.33	1.0
1,2-Dichloroethane	107-06-2	µg/L	5	5		0.39	1.0
1,2-Dichloropropane	78-87-5	µg/L	5	5		0.43	1.0
1,3,5-Trimethylbenzene	108-67-8	µg/L		480		0.25	1.0
1,3-Dichlorobenzene	541-73-1	µg/L		600		0.40	1.0
1,3-Dichloropropane	142-28-9	µg/L				0.36	1.0
1,4-Dichlorobenzene	106-46-7	µg/L	75	75		0.36	1.0
1,4-Dioxane	123-91-1	µg/L				41.1	100
2,2-Dichloropropane	594-20-7	µg/L				0.44	1.0
2-Chlorotoluene	95-49-8	µg/L				0.31	1.0
4-Chlorotoluene	106-43-4	µg/L				0.35	1.0
Benzene	71-43-2	µg/L	5	5		0.15	0.50
Bromobenzene	108-86-1	µg/L				0.36	1.0
Bromochloromethane	74-97-5	µg/L				0.430	1.0
Bromodichloromethane	75-27-4	µg/L	80	0.6		0.37	1.0
Bromoform	75-25-2	µg/L	80	4.4		0.48	1.0
Bromomethane	74-83-9	µg/L		10		0.80	3.0
Carbon Tetrachloride	56-23-5	µg/L	5	5		0.38	1.0

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
CFC-11	75-69-4	µg/L		3490		0.43	1.0
CFC-12	75-71-8	µg/L		1,000		0.67	3.0
Chlorobenzene	108-90-7	µg/L	100	100		0.38	1.0
Chlorodibromomethane	124-48-1	µg/L	80	60		0.49	1.0
Chloroethane	75-00-3	µg/L		400		0.50	1.0
Chloroform	67-66-3	µg/L	80	6		0.37	2.0
Chloromethane	74-87-3	µg/L		30		0.32	1.0
cis-1,2-Dichloroethene	156-59-2	µg/L	70	70		0.41	1.0
cis-1,3-Dichloropropene	10061-01-5	µg/L				0.42	1.0
Cymene (p-Isopropyltoluene)	99-87-6	µg/L				0.36	1.0
Dibromomethane	74-95-3	µg/L				0.27	1.0
Dichloromethane	75-09-2	µg/L	5	5		1.6	5.0
Di-isopropyl ether	108-20-3	µg/L				0.28	1.0
Ethylbenzene	100-41-4	µg/L	700	700		0.18	0.50
Hexachloro-1,3-butadiene	87-68-3	µg/L				0.45	1.0
Isopropylbenzene	98-82-8	µg/L				0.38	1.0
m&p-Xylenes	ARC-mpXyl	µg/L				0.18	1.0
Methyl-tert-butyl ether	1634-04-4	µg/L		60		0.39	1.0
Naphthalene	91-20-3	µg/L		100		0.34	1.0
n-Butylbenzene	104-51-8	µg/L				0.39	1.0
n-Propylbenzene	103-65-1	µg/L				0.41	1.0
o-Xylene	95-47-6	µg/L				0.22	0.50
sec-Butylbenzene	135-98-8	µg/L				0.40	1.0
Styrene (Monomer)	100-42-5	µg/L	100	100		0.39	1.0

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
tert-Butylbenzene	98-06-6	µg/L				0.40	1.0
Tetrachloroethene	127-18-4	µg/L	5	5		0.37	1.0
Toluene	108-88-3	µg/L	1,000	800		0.15	0.50
Total Xylenes	1330-20-7	µg/L	10,000	2,000		0.22	1.0
trans-1,2-Dichloroethene	156-60-5	µg/L	100	100		0.35	1.0
trans-1,3-Dichloropropene	10061-02-6	µg/L				0.36	1.0
Trichloroethene	79-01-6	µg/L	5	5		0.16	0.50
Vinyl chloride	75-01-4	µg/L	0.2	0.2		0.20	1.0
VOCs (USEPA 624)[5]							
Benzene	71-43-2	µg/L	5	5		0.15	0.50
Ethylbenzene	100-41-4	µg/L	700	700		0.18	0.50
Toluene	108-88-3	µg/L	1,000	800		0.15	0.50
Total Xylenes	1330-20-7	µg/L	10,000	2,000		0.40	1.0
SVOCs (USEPA 625)[5]							
1-Methylnaphthalene	90-12-0	µg/L				0.24	1.60
2-Methylnaphthalene	91-57-6	µg/L				0.067	1.60
Acenaphthene	83-32-9	µg/L		3,000		0.098	0.80
Acenaphthylene	208-96-8	µg/L				0.11	0.80
Anthracene	120-12-7	µg/L	0.2	0.2		0.15	0.80
Benz(a)anthracene	56-55-3	µg/L		0.2		0.052	0.80
Benzo(a)pyrene	50-32-8	µg/L				0.060	0.80
Benzo(b)fluoranthene	205-99-2	µg/L				0.065	0.80
Benzo(g,h,i)perylene	191-24-2	µg/L		0.2		0.39	0.80
Benzo(k)fluoranthene	207-08-9	µg/L				0.14	0.80

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Chrysene	218-01-9	µg/L		400		0.07	0.80
Dibenz(a,h)anthracene	53-70-3	µg/L		400		0.09	0.80
Fluoranthene	206-44-0	µg/L				0.16	0.80
Fluorene	86-73-7	µg/L		100		0.13	0.80
Indeno(1,2,3-cd)pyrene	193-39-5	µg/L				0.061	0.80
Naphthalene	91-20-3	µg/L		250		0.12	0.80
Phenanthrene	85-01-8	µg/L				0.17	0.80
Pyrene	129-00-0	µg/L				0.18	0.80
SVOCs (USEPA 522)							
1,4-Dioxane	123-91-1	µg/L		3		0.032	0.07
Pesticides (USEPA 525.2)							
Alachlor	15972-60-8	µg/L	2	2		0.01	0.1
Atrazine	1912-24-9	µg/L	3	3		0.01	0.1
Benzo(a)pyrene	50-32-8	µg/L	0.2	0.2		0.012	0.02
Di(2-ethylhexyl)adipate	103-23-1	µg/L	400			0.02	0.6
Di(2-ethylhexyl)phthalate	117-81-7	µg/L	6	6		0.1	0.6
Endrin	72-20-8	µg/L	2	2		0.009	0.01
gamma-BHC (Lindane)	58-89-9	µg/L	0.2	0.2		0.008	0.02
Heptachlor	76-44-8	µg/L	0.4	0.4		0.004	0.04
Heptachlor epoxide	1024-57-3	µg/L	0.2	0.2		0.004	0.02
Hexachlorobenzene	118-74-1	µg/L	1	1		0.01	0.1
Hexachlorocyclopentadiene	77-47-4	µg/L	50			0.01	0.1
Methoxychlor	72-43-5	µg/L	40	40		0.01	0.1
Metolachlor	51218-45-2	µg/L		100		0.01	0.1

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Metribuzin	21087-64-9	µg/L		70		0.01	0.1
Simazine	122-34-9	µg/L	4	4		0.03	0.07
Pesticides (USEPA 505)							
Chlordane	57-74-9	µg/L	2	2		0.02	0.1
Toxaphene	8001-35-2	µg/L	3	3		0.11	1
Metals (SW-846 6020A)							
Aluminum	7429-90-5	µg/L	50-200	200		24.6	100
Arsenic	7440-38-2	µg/L	10	10		0.23	1.0
Barium	7440-39-3	µg/L	2,000	2,000		0.73	2.50
Cadmium	7440-43-9	µg/L	5	5		0.17	0.50
Calcium	7440-70-2	µg/L				44.3	200
Chromium	7440-47-3	µg/L	100	100		1.14	5.00
Iron	7439-89-6	µg/L	300	300		46.7	100
Lead	7439-92-1	µg/L	15	15		0.19	0.50
Magnesium	7439-95-4	µg/L				49.4	200
Manganese	7439-96-5	µg/L	50	300		0.79	2.50
Potassium	7440-09-7	µg/L				111	500
Selenium	7782-49-2	µg/L	50	50		0.98	2.5
Silver	7440-22-4	µg/L	100	50		0.12	0.5
Sodium	7440-23-5	µg/L				77.3	200
Strontium	7440-24-6	µg/L				0.64	4.0
Metals (USEPA 200.8)[5]							
Arsenic	7440-38-2	µg/L	10	10		0.15	1.0
Lead (Eurofins Chicago)	7439-92-1	µg/L	15	15		0.16	0.50

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Lead (Eurofins Eaton)	7439-92-1	µg/L	15	15		0.29	0.5
Mercury (SW-846 7470A)							
Mercury	7439-97-6	µg/L	2	2		0.08	0.20
Radionuclides (USEPA 903.0, 904.0, 900.0)							
Radium-226	13982-63-3	pCi/L				NA	(QLs) 1.0
Radium-228	1562-20-1	pCi/L				NA	1.0
Gross Alpha	12587-46-1	pCi/L				NA	3.0
Gross Beta	12587-47-2	pCi/L				NA	4.0
General Chemistry (Analyte and Method)							
Alkalinity (SM2320B)	ARC-ALK[6]	µg/L				3740	5000
Alkalinity, Bicarbonate (SM2320B)	ARC-HCO3[6]	µg/L				3740	5000
Alkalinity, Carbonate (SM2320B)	ARC-CO3[6]	µg/L				3740	5000
Ammonia Nitrogen (SM4500-NH3-G)	7664-41-7	µg/L				100	200
Biological Oxygen Demand (SM5210B)	ARC-BOD[6]	µg/L				2000	2000
Bromide (SW9056A)	24959-67-9	µg/L				179	1000
Carbonaceous Biochemical Oxygen Demand (SM5210B)	ARC-CBOD[6]	µg/L				2000	2000
Chemical Oxygen Demand (SM5220C)	ARC-COD[6]	µg/L				6040	10000
Chloride (SW9056A)	16887-00-6	µg/L				116	1000
Chlorine (SW9251)	7782-50-5	%				995	2000
Flashpoint (SW1010A)	10-36-6	µg/L				25	25
Fluoride (F-, Anion) (SW9056A)	16984-48-8	µg/L	4,000	4,000		191	1000
n-Hexane Extractable Material (HEM) (Oil & Grease) (USEPA 1664B)	ARC-OG[6]	µg/L				1320	5000
Hexavalent Chromium (SW7196A)	18540-29-9	µg/L				3.19	10

Analyte	CAS Number	Units	Drinking Water NR 809 MCLs[1]	Groundwater NR 140 Public Health ES[2]	Table 2 Value	Laboratory Achievable Detection Limits[3,4]	
						MDL	RL
Nitrate-N (SW9056A)	14797-55-8	µg/L	10,000	10,000		43	1000
Nitrite (SW9056A)	14797-65-0	µg/L	1,000	1,000		70	1000
ortho-Phosphate (As P) (SW9056A)	ARC-ORTHO[6]	µg/L				133	1000
Perchlorate (SW6860)	14797-73-0	µg/L				0.058	0.2
pH (SM4500-H-B)	ARC-pH[6]	µg/L				0.20	0.20
Sulfate (SW9056A)	14808-79-8	µg/L				207	1000
Total Dissolved Solids (SM2540C)	ARC-TDS[6]	µg/L				4340	10000
Total Kjeldahl Nitrogen (SM4500-NORG-C)	ARC-TKN[6]	µg/L				244	400
Total Organic Carbon (SW9060A)	7732-18-5	µg/L				470	1000
Total Phosphorus (SM4500-P-E)	ARC-TP[6]	µg/L				23.9	50
Total Suspended Solids (SM2540D)	ARC-TSS[6]	µg/L				1930	5000

Notes:

CAS = Chemical Abstracts Service Registry
ES = Enforcement Standard
MCL = Maximum Contaminant Level
MDL = Method Detection Limit
µg/L = micrograms per liter
[1] = NR 809 MCL = ch. NR 809, Wisconsin Administrative Code, MCL.
[2] = NR 140 Public Health ES = s. NR 140.10, Wisconsin Administrative Code, public health related groundwater quality promulgated Enforcement Standard.
[3] = Concentrations detected less than the reporting limit but greater than the method detection limit must be reported with the appropriate qualifier.
[4] = The laboratory limits provided are current as of the writing of this QAPP and are subject to change at the time of the analysis. The MDLs are based upon laboratory MDL studies and must be low enough to support quantitation limits.
[5] = The laboratory will report analytical results associated with the Ditch surface water sampling using limit of detection and limit of quantitation nomenclature instead of MDL and RL, respectively, as provided in the above table.
[6] = No formal CAS number exists. Arcadis database identifiers are listed instead.

QAPP Worksheet #15-2 – Reference Limits and Evaluation (Chemical Analysis – Soils/Sediments)

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
Soils/Sediments					
PFAS Modified USEPA Method 537 (36 Analytes – WDNR List)					
Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg		0.00004	0.0002
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg		0.00004	0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg		0.00003	0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg		0.00003	0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	1.26 (non-industrial), 16.4 (industrial)	0.00005	0.0002
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg		0.00002	0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg		0.000048	0.0002
Perfluoroundecanoic acid (PFUnA)	2058-94-8	mg/kg		0.00004	0.0002
Perfluorododecanoic acid (PFDoA)	307-55-1	mg/kg		0.00003	0.0002
Perfluorotridecanoic acid (PFTriA)	72629-94-8	mg/kg		0.00002	0.0002
Perfluorotetradecanoic acid (PFTeA)	376-06-7	mg/kg		0.000037	0.0002
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	mg/kg		0.00004	0.0002
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	mg/kg		0.00007	0.0002
Perfluorobutanesulfonic acid (PFBS)	375-73-5	mg/kg	1,260 (non-industrial), 16,400 (industrial)	0.000014	0.0002
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	mg/kg		0.000014	0.0002
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	mg/kg		0.00003	0.0002

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	mg/kg		0.00005	0.0002
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	mg/kg	1.26 (non-industrial), 16.4 (industrial)	0.0002	0.0005
Perfluorononanesulfonic acid (PFNS)	68259-12-1	mg/kg		0.00003	0.0002
Perfluorodecanesulfonic acid (PFDS)	335-77-3	mg/kg		0.00005	0.0002
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	mg/kg		0.00005	0.0002
4:2 fluorotelomer sulfonate (4:2 FTS)	757124-72-4	mg/kg		0.00005	0.0002
6:2 fluorotelomer sulfonate (6:2 FTS)	27619-97-2	mg/kg		0.00003	0.002
8:2 fluorotelomer sulfonate (8:2 FTS)	39108-34-4	mg/kg		0.00003	0.0002
10:2 fluorotelomer sulfonate (10:2 FTS)	120226-60-0	mg/kg		0.00004	0.0002
Perfluorooctanesulfonamide (FOSA)	754-91-6	mg/kg		0.00003	0.0002
N-methylperfluorooctanesulfonamide (NMeFOSA)	31506-32-8	mg/kg		0.00005	0.0002
N-ethylperfluorooctanesulfonamide (NEtFOSA)	4151-50-2	mg/kg		0.00005	0.0002
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	mg/kg		0.00002	0.0002
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	mg/kg		0.00005	0.002
N-methylperfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	mg/kg		0.00005	0.0002
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	mg/kg		0.00003	0.0002
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	mg/kg		0.00004	0.0002
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	958445-44-8	mg/kg		0.00002	0.0002

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	mg/kg		0.00003	0.0002
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9	mg/kg		0.00002	0.0002
PFAS USEPA Method 1633/1633A (40 Analytes – WDNR List)					
Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg		0.000032	0.0004
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg		0.000049	0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg		0.000040	0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg		0.000033	0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	1.26 (non-industrial), 16.4 (industrial)	0.000062	0.0002
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg		0.000029	0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg		0.000024	0.0002
Perfluoroundecanoic acid (PFUnA)	2058-94-8	mg/kg		0.000028	0.0002
Perfluorododecanoic acid (PFDoA)	307-55-1	mg/kg		0.000027	0.0002
Perfluorotridecanoic acid (PFTriA)	72629-94-8	mg/kg		0.000029	0.0002
Perfluorotetradecanoic acid (PFTeA)	376-06-7	mg/kg		0.000058	0.0002
Perfluorobutanesulfonic acid (PFBS)	375-73-5	mg/kg	1,260 (non-industrial), 16,400 (industrial)	0.000025	0.0002
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	mg/kg		0.000040	0.0002
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	mg/kg		0.000020	0.0002
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	mg/kg		0.000016	0.0002
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	mg/kg	1.26 (non-industrial), 16.4 (industrial)	0.000025	0.0002

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
Perfluorononanesulfonic acid (PFNS)	68259-12-1	mg/kg		0.000023	0.0002
Perfluorodecanesulfonic acid (PFDS)	335-77-3	mg/kg		0.000021	0.0002
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	mg/kg		0.000037	0.0002
4:2 fluorotelomer sulfonate (4:2 FTS)	757124-72-4	mg/kg		0.000065	0.0004
6:2 FTS fluorotelomer sulfonate (6:2 FTS)	27619-97-2	mg/kg		0.000054	0.0004
8:2 FTS fluorotelomer sulfonate (8:2 FTS)	39108-34-4	mg/kg		0.000044	0.0004
10:2 fluorotelomer sulfonate (10:2 FTS)	120226-60-0	mg/kg		NA	NA
Perfluorooctanesulfonamide (FOSA)	754-91-6	mg/kg		0.000063	0.0002
N-methylperfluorooctanesulfonamide (NMeFOSA)	31506-32-8	mg/kg		0.000036	0.0002
N-ethylperfluorooctanesulfonamide (NEtFOSA)	4151-50-2	mg/kg		0.000021	0.0002
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	mg/kg		0.000016	0.0002
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	mg/kg		0.000017	0.0002
N-methylperfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	mg/kg		0.000088	0.001
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	mg/kg		0.000077	0.001
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	mg/kg		0.000029	0.0002
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	958445-44-8	mg/kg		0.000025	0.0002
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	mg/kg		0.000038	0.0002
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9	mg/kg		0.000075	0.0002

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	mg/kg		0.000022	0.0002
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	mg/kg		0.000036	0.0002
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	mg/kg		0.000038	0.0002
3-Perfluoropropylpropanoic acid (3:3 FTCA)	356-02-5	mg/kg		0.000075	0.0004
3-Perfluoropentylpropanoic acid (5:3 FTCA)	914637-49-3	mg/kg		0.000245	0.001
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	812-70-4	mg/kg		0.000214	0.001
VOCs (SW8260B)					
1,1,1,2-Tetrachloroethane	630-20-6	mg/kg		0.0005	0.001
1,1,1-Trichloroethane	71-55-6	mg/kg		0.0004	0.001
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg		0.0004	0.001
1,1,2-Trichloroethane	79-00-5	mg/kg		0.0004	0.001
1,1-Dichloroethane	75-34-3	mg/kg		0.0004	0.001
1,1-Dichloroethene	75-35-4	mg/kg		0.000	0.001
1,1-Dichloropropene	563-58-6	mg/kg		0.0003	0.001
1,2,3-Trichlorobenzene	87-61-6	mg/kg		0.0005	0.001
1,2,3-Trichloropropane	96-18-4	mg/kg		0.0004	0.002
1,2,4-Trichlorobenzene	120-82-1	mg/kg		0.0003	0.001
1,2,4-Trimethylbenzene	95-63-6	mg/kg		0.0004	0.001
1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg		0.002	0.005
1,2-Dibromoethane	106-93-4	mg/kg		0.0004	0.001
1,2-Dichlorobenzene	95-50-1	mg/kg		0.0003	0.001
1,2-Dichloroethane	107-06-2	mg/kg		0.0004	0.001

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
1,2-Dichloropropane	78-87-5	mg/kg		0.0004	0.001
1,3,5-Trimethylbenzene	108-67-8	mg/kg		0.0004	0.001
1,3-Dichlorobenzene	541-73-1	mg/kg		0.0004	0.001
1,3-Dichloropropane	142-28-9	mg/kg		0.0004	0.001
1,4-Dichlorobenzene	106-46-7	mg/kg		0.0004	0.001
2,2-Dichloropropane	594-20-7	mg/kg		0.0004	0.001
2-Chlorotoluene	95-49-8	mg/kg		0.0003	0.001
4-Chlorotoluene	106-43-4	mg/kg		0.0004	0.001
Benzene	71-43-2	mg/kg		0.0001	0.00025
Bromobenzene	108-86-1	mg/kg		0.0004	0.001
Bromochloromethane	74-97-5	mg/kg		0.0004	0.001
Bromodichloromethane	75-27-4	mg/kg		0.0004	0.001
Bromoform	75-25-2	mg/kg		0.0005	0.001
Bromomethane	74-83-9	mg/kg		0.0008	0.003
Carbon tetrachloride	56-23-5	mg/kg		0.0004	0.001
Chlorobenzene	108-90-7	mg/kg		0.0004	0.001
Chloroethane	75-00-3	mg/kg		0.0005	0.001
Chloroform	67-66-3	mg/kg		0.0004	0.002
Chloromethane	74-87-3	mg/kg		0.0003	0.001
cis-1,2-Dichloroethene	156-59-2	mg/kg		0.0004	0.001
cis-1,3-Dichloropropene	10061-01-5	mg/kg		0.0004	0.001
Dibromochloromethane	124-48-1	mg/kg		0.0005	0.001

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
Dibromomethane	74-95-3	mg/kg		0.0003	0.001
Dichlorodifluoromethane	75-71-8	mg/kg		0.0007	0.003
Ethylbenzene	100-41-4	mg/kg		0.0002	0.00025
Hexachlorobutadiene	87-68-3	mg/kg		0.0004	0.001
Isopropyl ether	108-20-3	mg/kg		0.0003	0.001
Isopropylbenzene	98-82-8	mg/kg		0.0004	0.001
m&p-Xylene	179601-23-1	mg/kg		0.0002	0.0005
Methyl tert-butyl ether	1634-04-4	mg/kg		0.0004	0.001
Methylene Chloride	75-09-2	mg/kg		0.002	0.005
Naphthalene	91-20-3	mg/kg		0.0003	0.001
n-Butylbenzene	104-51-8	mg/kg		0.0004	0.001
N-Propylbenzene	103-65-1	mg/kg		0.0004	0.001
o-Xylene	95-47-6	mg/kg		0.0002	0.00025
p-Isopropyltoluene	99-87-6	mg/kg		0.0004	0.001
sec-Butylbenzene	135-98-8	mg/kg		0.0004	0.001
Styrene	100-42-5	mg/kg		0.0004	0.001
tert-Butylbenzene	98-06-6	mg/kg		0.0004	0.001
Tetrachloroethene	127-18-4	mg/kg		0.0004	0.001
Toluene	108-88-3	mg/kg		0.0001	0.00025
trans-1,2-Dichloroethene	156-60-5	mg/kg		0.0004	0.001
trans-1,3-Dichloropropene	10061-02-6	mg/kg		0.0004	0.001
Trichloroethene	79-01-6	mg/kg		0.0002	0.0005

Analyte	CAS Number	Units	Soil RCL[1]	Laboratory Achievable Detection Limits[2,3]	
				MDL	RL
Trichlorofluoromethane	75-69-4	mg/kg		0.0004	0.001
Vinyl chloride	75-01-4	mg/kg		0.0003	0.001
Xylenes, Total	1330-20-7	mg/kg		0.0002	0.0005
General Chemistry (Analyte and Method)					
Percent moisture (ASTM D2216)	ARC-TSO	mg/kg		NA	NA
Total Organic Carbon (Lloyd Kahn)	ARC-TOC	mg/kg		684	750
Radionuclides (USEPA 901.1 Modified)					
Radium-226	13982-63-3	pCi/g		NA	1.0 (QLs)
Radium-228	1562-20-1	pCi/g		NA	1.0
Gross Alpha	12587-46-1	pCi/g		NA	10.0
Gross Beta	12587-47-2	pCi/g		NA	10.0

Notes:

mg/kg = milligrams per kilogram

NA = not applicable= Concentrations detected less than the quantitation limit but greater than the method detection limit must be reported with the appropriate qualifier

RCL = Residual Contaminant Level

[1] = Soil RCLs were calculated using USEPA's regional screening level web calculator, and following the procedures in § NR 720.12, Wis. Adm. Code, for determining soil direct contact RCLs protective of human health.

[2] = The laboratory limits provided are current as of the writing of this QAPP and are subject to change at the time of the analysis. The MDLs are based upon laboratory MDL studies and must be low enough to support quantitation limits.

[3] = The target reporting limits are based on wet weight. The actual reporting limits will vary based on sample weight and moisture content.

QAPP Worksheet #15-3 – Reference Limits and Evaluation (Chemical Analysis – Fish Tissue, SGS AXYS)

Analyte	CAS Number	Units (wet weight)	Laboratory Achievable Detection Limits[4,5]		
			MDL[1]	LOQ[2]	RL[3]
Tissue					
SGS AXYS MLA-110 (rev 02, ver 08) 33 compound sub-list specific for this project					
Perfluorobutanoate (PFBA)	375-22-4	ng/g	0.59	1.6	0.4
Perfluoropentanoate (PFPeA)	2706-90-3	ng/g	0.08	0.8	0.2
Perfluorohexanoate (PFHxA)	307-24-4	ng/g	0.18	0.4	0.1
Perfluoroheptanoate (PFHpA)	375-85-9	ng/g	0.09	0.4	0.1
Perfluorooctanoate (PFOA)	335-67-1	ng/g	0.15	0.4	0.1
Perfluorononanoate (PFNA)	375-95-1	ng/g	0.16	0.4	0.1
Perfluorodecanoate (PFDA)	335-76-2	ng/g	0.13	0.4	0.1
Perfluoroundecanoate (PFUnA)	2058-94-8	ng/g	0.17	0.4	0.1
Perfluorododecanoate (PFDoA)	307-55-1	ng/g	0.13	0.4	0.1
Perfluorotridecanoate (PFTrDA)	72629-94-8	ng/g	0.23	0.4	0.1
Perfluorotetradecanoate (PFTeDA)	376-06-7	ng/g	0.19	0.4	0.1
Perfluorobutanesulfonate (PFBS)	375-73-5	ng/g	0.07	0.4	0.1
Perfluoropentanesulfonate (PFPeS)	2706-91-4	ng/g	0.03	0.4	0.1
Perfluorohexanesulfonate (PFHxS)	355-46-4	ng/g	0.08	0.4	0.1
Perfluoroheptanesulfonate (PFHpS)	375-92-8	ng/g	0.04	0.4	0.1
Perfluorooctanesulfonate (PFOS)	1763-23-1	ng/g	0.29	0.4	0.1
Perfluorononanesulfonate (PFNS)	68259-12-1	ng/g	0.11	0.4	0.1

Analyte	CAS Number	Units (wet weight)	Laboratory Achievable Detection Limits[4,5]		
			MDL[1]	LOQ[2]	RL[3]
Perfluorodecanesulfonate (PFDS)	335-77-3	ng/g	0.10	0.4	0.1
Perfluorododecanesulfonate (PFDoS)	79780-39-5	ng/g	0.18	0.4	0.1
4:2 fluorotelomersulfonate (4:2 FTS)	757124-72-4	ng/g	0.74	1.6	0.4
6:2 fluorotelomersulfonate (6:2 FTS)	27619-97-2	ng/g	7.87	8.7	0.4
8:2 fluorotelomersulfonate (8:2 FTS)	39108-34-4	ng/g	1.19	1.6	0.4
N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	2355-31-9	ng/g	0.09	0.4	0.1
N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	2991-50-6	ng/g	0.14	0.4	0.1
Perfluorooctanesulfonamide (FOSA)	754-91-6	ng/g	0.14	0.4	0.1
N-Methylperfluorooctanesulfonamide (N-MeFOSA)	31506-32-8	ng/g	0.37	0.4	0.1
N-Ethylperfluorooctanesulfonamide (N-EtFOSA)	4151-50-2	ng/g	0.17	0.4	0.1
N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	24448-09-7	ng/g	9.98	11.0	1.0
N-Ethylperfluorooctanesulfonamidoethanol (N-EtFOSE)	1691-99-2	ng/g	1.50	4	1.0
Perfluoro-2-propoxypropanoate (HFPO-DA)	13252-13-6	ng/g	0.16	1.6	0.4
4-dioxa-3H-perfluorononanoate (ADONA)	919005-14-4	ng/g	0.38	1.6	0.4
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (9Cl-PF3ONS)	756426-58-1	ng/g	0.36	1.6	0.4
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (11Cl-PF3OUdS)	756426-58-1	ng/g	0.31	1.6	0.4
SGS AXYS MLA-110 (rev 02, ver. 15) by EPA 1633A (40 compounds list)					
Perfluorobutanoic acid (PFBA)	375-22-4	ng/g	0.59	1.6	0.4
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/g	0.08	0.8	0.2
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/g	0.18	0.4	0.1
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/g	0.09	0.4	0.1

Analyte	CAS Number	Units (wet weight)	Laboratory Achievable Detection Limits[4,5]		
			MDL[1]	LOQ[2]	RL[3]
Perfluorooctanoic acid (PFOA)	335-67-1	ng/g	0.15	0.4	0.1
Perfluorononanoic acid (PFNA)	375-95-1	ng/g	0.16	0.4	0.1
Perfluorodecanoic acid (PFDA)	335-76-2	ng/g	0.13	0.4	0.1
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/g	0.17	0.4	0.1
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/g	0.13	0.4	0.1
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/g	0.23	0.4	0.1
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/g	0.19	0.4	0.1
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/g	0.07	0.4	0.1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ng/g	0.03	0.4	0.1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/g	0.08	0.5	0.1
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	ng/g	0.04	0.4	0.1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ng/g	0.29	0.4	0.1
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ng/g	0.11	0.4	0.1
Perfluorodecanesulfonic acid (PFDS)	335-77-3	ng/g	0.10	0.4	0.1
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	ng/g	0.18	0.4	0.1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	ng/g	0.74	1.6	0.4
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	ng/g	7.87	8.7	0.4
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	ng/g	1.19	1.6	0.4
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	ng/g	0.09	0.4	0.1
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	ng/g	0.14	0.4	0.1
Perfluorooctanesulfonamide (PFOSA, FOSA)	754-91-6	ng/g	0.14	0.4	0.1
N-methyl perfluorooctanesulfonamide (NMeFOSA)	31506-32-8	ng/g	0.37	0.4	0.1

Analyte	CAS Number	Units (wet weight)	Laboratory Achievable Detection Limits[4,5]		
			MDL[1]	LOQ[2]	RL[3]
N-ethyl perfluorooctanesulfonamide (NEtFOSA)	4151-50-2	ng/g	0.17	0.4	0.1
N-methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	ng/g	9.98	11.0	1.0
N-ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	ng/g	1.50	4.0	1.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	ng/g	0.16	1.6	0.4
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	ng/g	0.38	1.6	0.4
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	ng/g	0.36	1.6	0.4
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	756426-58-1	ng/g	0.31	1.6	0.4
3-Perfluoropropyl propanoic acid (3:3 FTCA)	356-02-5	ng/g	0.25	1.6	0.4
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	914637-49-3	ng/g	3.15	10.0	2.5
3-Perfluoroheptyl propanoic acid (7:3 FTCA)	812-70-4	ng/g	0.85	10.0	2.5
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	ng/g	0.05	0.4	0.1
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	ng/g	0.07	0.4	0.1
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	ng/g	0.07	0.8	0.2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	ng/g	1.60	0.8	0.2

Notes:

LOQ = Limit of Quantitation

[1] = The MDLs are based upon laboratory MDL studies as a general demonstration of method detection limits. Used a reference value only (no reporting or flagging around this value).

[2] = The LOQ is the lowest concentration at which test accuracy (precision and bias) has been demonstrated. MLA-110 uses the “C-Cal”. Concentrations detected less than the LOQ but greater than the reporting limit will have a J flag applied.

[3] = The RL is the lowest concentration value that SGS AXYS routinely reports for the method. It is equal to the greater of the sensitivity standard (A-Cal) or the SDL (sample specific detection limit determined by converting the area equivalent of 3.0 times the estimated chromatographic noise height to a concentration in the same manner that target peak responses are converted to final concentrations).

[4] = The laboratory limits provided are current as of the writing of this QAPP and are subject to change at the time of the analysis. The MDLs are based upon laboratory MDL studies and must be low enough to support quantitation limits.

[5] = Based on 2 grams of tissue, wet weight.

QAPP Worksheet #15-4 – Reference Limits and Evaluation (Chemical Analysis – Fish Tissue, Eurofins)

Analyte	CAS Number	Units	Laboratory Achievable Detection Limits[3]	
			MDL[1]	RL[2]
Tissue				
PFAS Modified USEPA Method 537 (36 Analytes – WDNR List)				
Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg	0.0001	0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg	0.0004	0.001
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg	0.0002	0.001
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg	0.0001	0.001
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	0.0004	0.001
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg	0.000	0.001
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg	0.0001	0.001
Perfluoroundecanoic acid (PFUnA)	2058-94-8	mg/kg	0.0002	0.001
Perfluorododecanoic acid (PFDoA)	307-55-1	mg/kg	0.0003	0.001
Perfluorotridecanoic acid (PFTriA)	72629-94-8	mg/kg	0.0003	0.001
Perfluorotetradecanoic acid (PFTeA)	376-06-7	mg/kg	0.0003	0.001
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	mg/kg	0.0002	0.001
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	mg/kg	0.0001	0.001
Perfluorobutanesulfonic acid (PFBS)	375-73-5	mg/kg	0.0001	0.001
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	mg/kg	0.0001	0.001
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	mg/kg	0.0002	0.001
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	mg/kg	0.0002	0.001

Analyte	CAS Number	Units	Laboratory Achievable Detection Limits[3]	
			MDL[1]	RL[2]
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	mg/kg	0.001	0.0025
Perfluorononanesulfonic acid (PFNS)	68259-12-1	mg/kg	0.0001	0.001
Perfluorodecanesulfonic acid (PFDS)	335-77-3	mg/kg	0.0002	0.001
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	mg/kg	0.0003	0.001
4:2 fluorotelomer sulfonate (4:2 FTS)	757124-72-4	mg/kg	0.002	0.01
6:2 fluorotelomer sulfonate (6:2 FTS)	27619-97-2	mg/kg	0.0008	0.01
8:2 fluorotelomer sulfonate (8:2 FTS)	39108-34-4	mg/kg	0.001	0.01
10:2 fluorotelomer sulfonate (10:2 FTS)	120226-60-0	mg/kg	0.0001	0.001
Perfluorooctanesulfonamide (FOSA)	754-91-6	mg/kg	0.0004	0.001
NMeFOSA	31506-32-8	mg/kg	0.0001	0.001
NEtFOSA	4151-50-2	mg/kg	0.001	0.001
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	mg/kg	0.002	0.01
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	mg/kg	0.002	0.01
N-methylperfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	mg/kg	0.0004	0.001
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	mg/kg	0.0002	0.001
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	mg/kg	0.0006	0.00125
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	958445-44-8	mg/kg	0.0001	0.001
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	mg/kg	0.0004	0.001
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9	mg/kg	0.0001	0.001
PFAS USEPA Method 1633/1633A (40 Analytes – WDNR List)				
Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg	0.00012	0.0008
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg	0.000064	0.0004

Analyte	CAS Number	Units	Laboratory Achievable Detection Limits[3]	
			MDL[1]	RL[2]
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg	0.000092	0.0004
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg	0.000045	0.0004
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	0.00016	0.0004
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg	0.000096	0.0004
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg	0.000092	0.0004
Perfluoroundecanoic acid (PFUnA)	2058-94-8	mg/kg	0.00030	0.0004
Perfluorododecanoic acid (PFDoA)	307-55-1	mg/kg	0.00015	0.0004
Perfluorotridecanoic acid (PFTriA)	72629-94-8	mg/kg	0.00021	0.0004
Perfluorotetradecanoic acid (PFTeA)	376-06-7	mg/kg	0.00013	0.0004
Perfluorobutanesulfonic acid (PFBS)	375-73-5	mg/kg	0.000046	0.0004
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	mg/kg	0.00017	0.0004
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	mg/kg	0.000072	0.0004
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	mg/kg	0.000073	0.0004
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	mg/kg	0.000084	0.0004
Perfluorononanesulfonic acid (PFNS)	68259-12-1	mg/kg	0.000073	0.0004
Perfluorodecanesulfonic acid (PFDS)	335-77-3	mg/kg	0.000096	0.0004
Perfluorododecanesulfonic acid (PFDoS)	79780-39-5	mg/kg	0.000086	0.0004
4:2 fluorotelomer sulfonate (4:2 FTS)	757124-72-4	mg/kg	0.00013	0.0008
6:2 FTS fluorotelomer sulfonate (6:2 FTS)	27619-97-2	mg/kg	0.00017	0.0008
8:2 FTS fluorotelomer sulfonate (8:2 FTS)	39108-34-4	mg/kg	0.00019	0.0008
10:2 fluorotelomer sulfonate (10:2 FTS)	120226-60-0	mg/kg	NA	NA
Perfluorooctanesulfonamide (FOSA)	754-91-6	mg/kg	0.00068	0.0004

Analyte	CAS Number	Units	Laboratory Achievable Detection Limits[3]	
			MDL[1]	RL[2]
N-methylperfluorooctanesulfonamide (NMeFOSA)	31506-32-8	mg/kg	0.00092	0.0004
N-ethylperfluorooctanesulfonamide (NEtFOSA)	4151-50-2	mg/kg	0.00012	0.0004
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	mg/kg	0.00011	0.0004
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	mg/kg	0.000067	0.0004
N-methylperfluorooctanesulfonamidoethanol (NMeFOSE)	24448-09-7	mg/kg	0.00030	0.002
N-ethylperfluorooctanesulfonamidoethanol (NEtFOSE)	1691-99-2	mg/kg	0.00062	0.002
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	mg/kg	0.000056	0.0004
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	958445-44-8	mg/kg	0.00017	0.0004
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	mg/kg	0.00026	0.0004
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	83329-89-9	mg/kg	0.00010	0.0004
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	mg/kg	0.000099	0.0004
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	mg/kg	0.00012	0.0004
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	mg/kg	0.00011	0.0004
3-Perfluoropropylpropanoic acid (3:3 FTCA)	356-02-5	mg/kg	0.00019	0.0008
3-Perfluoropentylpropanoic acid (5:3 FTCA)	914637-49-3	mg/kg	0.00065	0.002
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	812-70-4	mg/kg	0.00049	0.002

Notes:

[1] = The laboratory limits provided are current as of the writing of this QAPP and are subject to change at the time of the analysis. The MDLs are based upon laboratory MDL studies and must be low enough to support quantitation limits.

[2] = Concentrations detected less than the reporting limit but greater than the method detection limit must be reported with the appropriate qualifier.

[3] = Reporting limits and method detection limits are in wet weight.

QAPP Worksheet #17a – General Investigation Design and Work Flow

This worksheet generally describes Definable Features of Work (DFW) and tasks that will be performed to meet the requirements and objectives of the sampling activities of the project. The **Site Investigation Work Plans** will provide a detailed approach for the sampling.

Table 3: Definable Features of Work and Associated Activities

DFW	Associated Activities	Supporting Documents
DFW1: Mobilization / Sampling Preparation	Contact specific WDNR, Tyco, homeowners, and other property owners/stakeholders, as relevant. Mobilize staff. Perform utility locate, if needed. Obtain any required permits.	Site Investigation Work Plans QAPP Health and Safety Plan (HASP)
DFW2: Collect Environmental Data	Collect all required samples.	Site Investigation Work Plans Data Management Plan (DMP) QAPP HASP Field SOPs
DFW3: Demobilization	Demobilization of all staff and equipment from the site.	QAPP HASP
DFW4: Compile and Report Sampling Data	Compile, analyze, and report documented results from the sampling. Refine the CSM.	DMP QAPP Data submission to WDNR and homeowners/property owners, as relevant

Overall Approach Rationale

The overall rationale is described in **Worksheet #11**.

DFW1: Mobilization/Sampling Preparation

The mobilization period for the completion of the sampling will include mobilizing staff to include these general activities, not in any particular order:

- Identify/procure, package, ship, and inventory project equipment.
- Coordinate communications with homeowners and other property owners/stakeholders, WDNR, and Tyco for logistical support.
- Finalize sampling schedules.
- Initiate utility checklist items, including completing public utility One Call (811) and coordinating with private utility locator for subsurface scopes of work.
- Test and inspect field sampling equipment (See **Worksheet #22** for details).
- Assemble and transport the sampling team.

- Verify that all forms and project documentation are in order and personnel understand their responsibilities regarding completion of project reporting requirements.
- Obtain necessary access permissions.
- Obtain required permits.

All site-specific mobilization requirements will be documented within **Site Investigation Work Plans**.

DFW2: Collect Environmental Data

Environmental data will be collected as presented within **Site Investigation Work Plans**.

DFW3: Demobilization

The investigation team will demobilize once all field activities are complete. Investigation-derived waste (IDW) water containing PFAS will be processed using the GETS with an effluent confirmation sample collected for PFAS analyses. IDW soil and sediment containing PFAS will be containerized in 55-gallon drums and staged at the FTC facility prior to determination of final management practices. All non-IDW wastes will be removed from the site immediately upon completion of each day's field activities. A post-activity inspection will be conducted by the Field Team Lead to confirm the location is left clean.

DFW4: Compile and Report Sampling Data

Results of the sampling will be compiled, validated, and assessed for usability by Arcadis. The data will be submitted to WDNR and homeowners, as applicable, 10 business days after final receipt with an explanation of cause and significance. The site investigation data will be used to further refine the CSMs and inform interim remedial actions, as necessary.

QAPP Worksheet #17b – General Investigation Design and Rationale

This worksheet generally describes the design of the investigation activities. All field activities will be conducted in accordance with the approved HASP. The sampling media and locations will be identified in the **Site Investigation Work Plans**.

All samples will be collected in accordance with the field SOPs listed in **Worksheet #21**, which take into consideration PFAS-specific sampling guidelines.

Field SOPs are listed in **Worksheet #21** and provided in **Appendix A**.

Soil Sampling

Soil samples will be collected for the analysis of PFAS following the soil sampling protocols (**P-10 – TGI – PFAS Field Sampling (all media); P-14 – TGI –Vertical Aquifer Profiling for PFAS Analysis**) detailed in **Appendix A.** The sampling method establishes equipment requirements, procedures for equipment and containers before sampling, sampling procedures under various conditions, collecting equipment blank samples (**P-13 – TGI – Equipment and Reagent Blank Sample Collection for PFAS Analysis**), field duplicate requirements, and storing samples to confirm that sample contamination does not occur during collection, transport, and analysis. Soil samples will be analyzed for PFAS and may additionally be subject to SPLP and/or Total Organic Carbon, pH, and clay content analysis, depending on data interpretation needs (**Worksheet #10**).

Sediment Sampling

Sediment samples to be utilized for the analysis of PFAS will be collected following the sediment sampling protocol (**P-10 – TGI – PFAS Field Sampling (all media); P-15 – TGI – Sediment, Surface Water, and Stormwater Sample Collection for PFAS Analysis**) detailed in **Appendix A**. The sampling method establishes equipment requirements, procedures for equipment and containers before sampling, sampling procedures under various conditions, collecting equipment blank samples (**P-13 – TGI – Equipment and Reagent Blank Sample Collection for PFAS Analysis**), field duplicate requirements, and storing samples to confirm that sample contamination does not occur during collection, transport, and analysis. Sediment samples will be analyzed for PFAS (**Worksheet #20**), Total Organic Carbon, and grain size.

Surface Water and Stormwater Sampling

Surface water samples to be utilized for the analysis of PFAS, including stormwater samples, will be collected following the surface water sampling protocol (**P-10 – TGI – PFAS Field Sampling (all media); P-15 – TGI – Sediment, Surface Water, and Stormwater Sample Collection for PFAS Analysis**) detailed in **Appendix A**. The sampling method establishes equipment requirements, procedures for equipment and containers before sampling, sampling procedures under various conditions, collecting equipment blank samples (**P-13 – TGI – Equipment and Reagent Blank Sample Collection for PFAS Analysis**), field duplicate requirements, and storing samples to confirm that sample contamination does not occur during collection, transport, and analysis. Surface water samples will be analyzed for PFAS (**Worksheet #20**). Additionally, field parameters (temperature, pH, conductivity, dissolved oxygen, turbidity, and oxidation-reduction potential) will be measured during select surface water sampling activities, including the Green Bay surface water sampling.

Groundwater Sampling

Groundwater samples to be utilized for the analysis of PFAS will be collected following the groundwater sampling protocol (**P-10 – TGI – PFAS Field Sampling (all media); P-11 – TGI – PFAS Sampling Procedures and Low-Flow Groundwater Purging for Monitoring Wells; P14 – TGI – Soil and Groundwater Sampling and Vertical Aquifer Profiling for PFAS Analysis**) detailed in **Appendix A**. The sampling method establishes equipment requirements, procedures for equipment and containers before sampling, sampling procedures under various conditions, collecting equipment blank samples (**P-13 – TGI – Equipment and Reagent Blank Sample Collection for PFAS Analysis**), field duplicate requirements, and storing samples to confirm that sample contamination does not occur during collection, transport and analysis. Groundwater samples will be analyzed for PFAS (**Worksheet #20**). Additionally, field parameters (temperature, pH, conductivity, dissolved oxygen, turbidity, and oxidation-reduction potential) will be measured during groundwater sampling to confirm a stable sample is collected and, potentially, to inform the CSMs.

Potable Well Water Sampling

Potable well water samples to be utilized for the analysis of PFAS will be collected following the potable water sampling protocol (**P-09 – TGI – PFAS Potable Water Sampling Guidance**) detailed in **Appendix A**. The sampling method establishes equipment requirements, procedures for equipment and containers before sampling, sampling procedures under various conditions, field duplicate requirements, and storing samples to confirm that sample contamination does not occur during collection, transport, and analysis. Potable well water samples will be analyzed for PFAS (**Worksheet #20**). Potable well water samples collected as part of the investigation related to the land applied biosolids may also be analyzed for 1,4-dioxane, pesticides, and lead.

Fish Tissue Sampling

Fish tissue samples to be utilized for the analysis of PFAS will be collected following the protocol described in the **Fish Tissue Sampling Work Plan**. The sampling method establishes equipment requirements, procedures for equipment and containers before sampling, sampling procedures under various conditions, and storing samples to confirm that sample contamination does not occur during collection, transport, and analysis. Fish tissue samples will be analyzed for PFAS (**Worksheet #20**).

Air Sampling

Laboratory methods are not yet widely available to analyze air for PFAS. Until such time as laboratory methods are well developed, sampling of air for PFAS is not being considered.

Laboratories

Eurofins, Chicago, Illinois is the primary laboratory. SGS AXYS, Sidney, British Columbia will conduct PFAS analysis in fish tissue. Arcadis will validate the data from the laboratory and prepare data validation reports.

QAPP Worksheet #18 – Sampling Locations and Methods

See **Worksheet #1 & #2** for work plans with more detailed sampling location information. See **Worksheet #11** for sampling rationale and DQOs. See **Worksheet #20** for applicable QC frequency.

Sampling Location/ID Number	Matrix	Sample Type and Number	Analytical Group	Concentration Level	Number of Samples	Sampling SOP Reference Number	Rationale for Sampling Location
Sampling related to FTC, Stanton Street, or Land Applied Biosolids Site Investigations	Groundwater, Soil, Surface Water, Stormwater, Sediment	See Applicable Work Plan (Item 3 in Worksheet #1 & 2)	PFAS	Variable	See Applicable Site Investigation Work Plan	P-10, P-11, P-15	See Applicable Work Plan
Ditch and Treatment System Sampling	Surface Water	See Applicable Work Plan (Item 3 in Worksheet #1 & 2)	PFAS	Low	See Applicable Site Investigation Work Plan	P-10, P-15	See Applicable Work Plan
Private well and POET system treatment sampling	Groundwater, Drinking Water	See Applicable Work Plan (Item 3 in Worksheet #1 & 2)	PFAS, Arsenic	Low	See Applicable Site Investigation Work Plan	P-09	See Applicable Work Plan
Land-Applied Biosolids private well sampling	Groundwater, Drinking Water	See Applicable Work Plan (Item 3 in Worksheet #1 & 2)	PFAS, 1-4-dioxane, pesticides, lead	Unknown	See Applicable Site Investigation Work Plan	P-09	See Applicable Work Plan
Fish tissue sampling in surface water	Fish Tissue	See Applicable Work Plan (Item 3 in Worksheet #1 & 2)	PFAS	Unknown	See Applicable Site Investigation Work Plan	N/A – See Applicable Work Plan	See Applicable Work Plan

QAPP Worksheet #19 & 30 – Sample Containers, Preservation, and Hold Times

Laboratories

Samples will be sent to the Eurofins – Chicago, Illinois for VOCs, SVOCs, PAHs, 1,4-Dioxane, Pesticides, metals, radionuclides, and general chemistry parameters:

Eurofins Chicago
18410 Crossing Dr Suite E
Tinley Park, IL 60487

And

Eurofins Pittsburgh (total organic carbon in solids by Lloyd Kahn)
301 Alpha Drive
Pittsburgh, PA 15238

And

Eurofins St. Louis (Radionuclides)
13715 Rider Trail North
Earth City, MO 63045

Samples will be sent to Eurofins Sacramento for PFAS analysis:

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Please note that the Eurofins location where samples are shipped may vary depending on, but not limited to, the laboratory capacity and/or the analyses required at time of sampling.

Fish tissue samples requiring PFAS analysis will be sent to SGS AXYS – Sidney, British Columbia:

SGS AXYS
2045 Mills Road West
Sidney, British Columbia, Canada V8L 5X2

Required Accreditations/Certifications

Eurofins Chicago:

a. National Environmental Laboratory Accreditation Program (NELAP) ID 100201
b. WDNR ID 999580010.

Eurofins Sacramento:

a. NELAP ID 4040-017

b. WDNR ID 998204680

Eurofins Eaton:

a. NELAP ID E87775.
b. WDNR ID 999766900

Eurofins Burlington:

a. State of New Jersey Department of Environmental Protection ID VT972
b. WDNR ID 399140830

Eurofins Denver:

a. NELAP ID 4025-016
b. WDNR ID 999615430

Eurofins Savannah:

a. NELAP ID T104704185-22-20
b. WDNR ID 999819810

Eurofins St. Louis

a. State of Louisiana Department of Environmental Protection Agency Interest No. 106151, Activity No. ACC20220001
b. NELAC ID E87689

SGS AXYS:

a. NELAP ID E871007

The integrity of the analysis of the submitted sites samples analysis will be made certain through the use of laboratories that will maintain current appropriate NELAP and WDNR certifications. Copies of current laboratory accreditations are included in Appendix B. Because the laboratory accreditations expire, copies of the most current accreditations will be requested from the laboratories and the QAM will confirm that the laboratories are in compliance with project requirements prior to sample submittal. Prior to conducting further investigations at the site most recent required laboratory certifications will be stored in the project file and will be available for investigation agencies upon request.

Back-up Laboratory: Not identified

Sample Delivery Method: FedEx or UPS for overnight delivery or courier to the laboratory

Analytical Group	Analytical and Preparation Method/SOP Reference	Containers (number, size, and type)[1]	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)[2]
Residential Well Monitoring (POET/Private Well)				
PFAS (drinking water)	USEPA Modified 537/ L2	2x250 millilter (mL) poly bottle	Cool to <6°C	28 days to extraction, 30 days to analysis
Metals (Arsenic)	USEPA 200.8/L15/L16	1x250 mL poly bottle	HNO_3 to pH $\leq$2	180 days to analysis (metals)
Groundwater and Surface Water (Ditch Monitoring, Stanton Street Investigations)				
PFAS	USEPA Modified 537/ L2	2x250 mL poly bottle	Cool to <6°C	28 days to extraction, 30 days to analysis
PFAS	USEPA 1633/1633A/ L46	3x125 mL poly bottle	Cool to <6°C	28 days from collection to extraction (7 days from collection to extraction if NMeFOSE, NEtFOSE, NMeFOSAA, and/or NEtFOSAA are analytes of interest); and 28 days from extraction to analysis
VOCs	SW8260B/ L4	3x40 mL glass VOA vial	Hydrochloric acid to pH $\leq$2, Cool to <6^{0}C	14 days to analysis
SVOCs/PAHs	SW8270D/ L9	2x250 mL amber glass bottles	Cool to <6°C	7 days to extraction 40 days to analysis
HEM (Oil & Grease)	USEPA 1664B/ L28	2x1 Liter amber glass bottles	H_2SO_4 to pH $\leq$2, Cool to <6^{0}C	28 days to analysis
Total Suspended Solids	SM2540D/ L38	500 mL poly bottle	Cool to <6°C	7 days to analysis
Ra-228 in Water	Method/L-21	1 Liter plastic	HNO3	NONE
Gross Alpha, and Gross Beta in Water	Method/L-22	500ml plastic	HNO3	NONE
Ra-226 in Water	Method/L-23	1 Liter Plastic	HNO3	NONE

Analytical Group	Analytical and Preparation Method/SOP Reference	Containers (number, size, and type)[1]	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)[2]
Ra-226, Ra-228, Gross Alpha, and Gross Beta in Water	Method/L-24	2 Liters 1x500ml	HNO3	NONE
Biosolids Private Well Sampling				
PFAS	USEPA Modified 537/ L2	2x250 mL poly bottle	Cool to <6°C	28 days to extraction, 30 days to analysis
PFAS	USEPA 1633/1633A/ L46	3x125 mL poly bottle	Cool to <6°C	28 days from collection to extraction (7 days from collection to extraction if NMeFOSE, NEtFOSE, NMeFOSAA, and/or NEtFOSAA are analytes of interest); and 28 days from extraction to analysis
1,4-Dioxane	USEPA 522/ L10	2x250 mL amber glass bottles	Na_2O_3S/$NaHSO_4$, Cool to <6°C	28 days to extraction 28 days to analysis in dark at -5°C
Pesticides	USEPA 505/ L11	2x40 mL glass VOA vial	$Na_2S_2O_3$, Cool to <6°C	7 days to extraction, 24 hours to analysis
Pesticides	USEPA 525.2/ L12	2x1 Liter amber glass bottles	Na_2SO_3/ Hydrochloric acid, Cool to <6°C	14 days to extraction, 30 days to analysis
Metals (Lead)	USEPA 200.8/ L13/L14	1x250mL poly bottle	HNO_3 to pH ≤ 2	180 days to analysis (Metals)
Soil				
PFAS	USEPA Modified 537/ L2	4-ounce high density polyethylene (HDPE) container	Cool to <6°C	28 days to extraction, 30 days to analysis

Analytical Group	Analytical and Preparation Method/SOP Reference	Containers (number, size, and type)[1]	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)[2]
PFAS	USEPA 1633/1633A/ L46	4-ounce high density polyethylene (HDPE) container	Cool to <6°C	90 days to extraction (3 days from collection to extraction if NFDHA is included); 90 days from extraction to analysis
VOCs	SW8260B/ L4/L5	1x40 mL VOA Vial	MeOH, Cool to <6^{0}C	14 days to analysis
SVOCs	SW8270D/ L4/L5	1 x 4-ounce glass jar with Teflon®-lined lid	Cool to <6°C	14 days to extraction, 40 days to analysis
Total Organic Carbon (soil/sediment)	Lloyd Kahn L41	4 ounce wide-mouth glass jar	Cool to <6^{0}C	14 days to analysis (Lloyd Kahn)
Ra-226, Ra-228 in Soil	Method/L43/L44/L45	4oz plastic	NONE	NONE
Fish Tissue				
PFAS	USEPA Modified 537/ L42	Ziplock® bag or comparable	Freeze immediately at laboratory < -10°C; extracts to <6^{0}C	1 year to extraction 30 days to analysis
PFAS	USEPA 1633/1633A/ L46	4-ounce high density polyethylene (HDPE) container	Freeze immediately at laboratory < -10°C; extracts to <6^{0}C	90 days to extraction (3 days from collection to extraction if NFDHA is included); 90 days from extraction to analysis
Waste Characterization				
PFAS	USEPA Modified 537/ L2	2x250 mL poly bottle	Cool to <6°C	28 days to extraction, 30 days to analysis

Analytical Group	Analytical and Preparation Method/SOP Reference	Containers (number, size, and type)[1]	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)[2]
PFAS	USEPA 1633/1633A/ L46	3x125 mL poly bottle	Cool to <6°C	28 days from collection to extraction (7 days from collection to extraction if NMeFOSE, NEtFOSE, NMeFOSAA, and/or NEtFOSAA are analytes of interest); and 28 days from extraction to analysis
SPLP	SW1312/USEPA Modified 537/ L2/L40	2x4 ounce poly bottle	Cool to <6°C	28 days to SPLP extraction, 28 days from SPLP to extraction 30 days from extraction to analysis
VOCs	USEPA 624/ L3	3x40 mL glass VOA vial	Hydrochloric acid to pH $\leq$2, Cool to <6°C	14 days to analysis
SVOCs/PAHs	USEPA 625/ L8	2x250 mL amber glass bottles	Cool to <6°C	7 days to extraction 40 days to analysis
Metals (including Mercury)	USEPA 200.8/245.1 L15/L19	1x250 mL poly bottle	HNO_3 to pH $\leq$2 (Cool to <6°C for mercury)	180 days to analysis (Metals) 28 days to analysis (Mercury)
Alkalinity (total, bicarbonate, and carbonate)	SM2320B/ L20	250 mL poly bottle (no headspace)	Cool to <6°C	14 days to analysis
Ammonia Nitrogen	SM4500-NH3-G/ L21	250 mL poly bottle	H_2SO_4 to pH $\leq$2, Cool to <6°C	28 days to analysis
Anions (bromide, chloride, fluoride, sulfate)	SW9056A/ L22	500 mL poly bottle	Cool to <6°C	28 days to analysis
Biological Oxygen Demand (5-day)	SM5210B/ L23	500 mL poly bottle	Cool to <6°C	48 hours to analysis

Analytical Group	Analytical and Preparation Method/SOP Reference	Containers (number, size, and type)[1]	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)[2]
Carbonaceous Biochemical Oxygen Demand	SM5210B/ L24	500 mL poly bottle	Cool to <6^{0}C	48 hours to analysis
Chemical Oxygen Demand	SM5220C/ L25	250 mL poly bottle	H_2SO_4 to pH $\leq$2, Cool to <6^{0}C	28 days to analysis
T Res Chlorine	SW9251/ L26	250 mL poly bottle	Cool to <6^{0}C	Immediate
Flashpoint	SW1010A/ L27	250 mL poly bottle	Cool to <6^{0}C	28 days to analysis
HEM (Oil & Grease)	USEPA 1664B/ L28	2x1 Liter amber glass bottles	H_2SO_4 to pH $\leq$2, Cool to <6^{0}C	28 days to analysis
Hexavalent Chromium	SW7196A/ L29	250 mL poly bottle	Cool to <6°C	24 hours to analysis
Nitrate-N, Nitrite-N	SW9056A/ L30	250 mL poly bottle	Cool to <6°C	48 hours to analysis
ortho-Phosphate (As P)	SM4500P-E/ L31	250 mL poly bottle	Cool to <6°C	48 hours to analysis
Perchlorate	SW6860/ L32	250 mL poly bottle	Cool to <6°C	28 days to analysis
pH	SM4500-H-B/ L33	250 mL poly bottle	Cool to <6°C	Immediate
Total Dissolved Solids	SM2540C/ L34	500 mL poly bottle	Cool to <6°C	7 days to analysis
Total Kjeldahl Nitrogen	SM4500NH_3-H/ L35	250 mL poly bottle	H_2SO_4 to pH $\leq$2, Cool to <6^{0}C	28 days to analysis
Total Organic Carbon	SM5310C/SW9060 A/ L36	2x40 mL VOA vials	H_2SO_4 to pH $\leq$2, Cool to <6^{0}C	28 days to analysis
Total Phosphorus	SM4500-P-E/ L37	250 mL poly bottle	H_2SO_4 to pH $\leq$2, Cool to <6^{0}C	28 days to analysis
Total Suspended Solids	SM2540D/ L38	500 mL poly bottle	Cool to <6°C	7 days to analysis

Analytical Group	Analytical and Preparation Method/SOP Reference	Containers (number, size, and type)[1]	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)[2]

Notes:
HNO_3 = nitric acid
H_2SO_4 = sulfuric acid
Na_2SO_3 = sodium sulfite
$NaHSO_4$ = sodium bisulfate
$Na_2S_2O_3$ = sodium thiosulfate
°C = degrees Celsius
mL = milliliters
VOA = volatile organic analysis
[1] = The laboratory should be consulted prior to sample collection, as it may be possible to combine sample volume for multiple analyses in one sample container, particularly for soil and sediment samples.
[2] = It is imperative that all samples are submitted to the laboratory with ample time for the analysis to be completed within the holding time. Missing a holding time is unacceptable and may result in unusable data if the holding time is missed.

QAPP Worksheet #20 – Field QC Summary

Analysis	Laboratory[1]	Analytical and Preparation SOP[2]	Estimated Environ. Sample Quantity	Field QC Analyses								Laboratory QC Sample						Total
				Trip Blank		Field Blank		Field Duplicate		Equipment Blank		MS		MSD[5]		Lab Duplicate[5]		
				Frequency (Freq.)	Number (No.)	Freq.	No.	Freq.[4]	No.	Freq.[4]	No.	Freq.[3]	No.	Freq.[3]	No.	Freq.[3]	No.	
Residential Well Monitoring (POET/Private Well)[6]																		
PFAS	Eurofins	USEPA 537 Modified/1633/1633A L2/L46	TBD	NA	--	1/ SDG	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
Metals (Arsenic)	Eurofins	USEPA 200.8/ L15/L16	TBD	NA	--	1/ SDG	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Groundwater and Surface Water (Ditch Monitoring, Stanton Street Investigations)																		
PFAS	Eurofins	USEPA 537 Modified/1633/1633A L2/L46	TBD	NA	--	1/day	1	1/10	TBD	1/day	--	1/20	TBD	1/20	TBD	NA	--	TBD
VOCs	Eurofins	USEPA 624/ L4	TBD	1/Cooler	TBD	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
SVOCs/PAHs	Eurofins	USEPA 625/ L9	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
HEM (Oil & Grease)	Eurofins	USEPA 1664B/ L28	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Total Suspended Solids	Eurofins	SM 2540D/ L38	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Biosolids Private Well Sampling[6]																		
PFAS	Eurofins	USEPA 537 Modified/1633/1633A L2/L46	TBD	NA	--	1/ SDG	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
1,4-Dioxane	Eurofins	USEPA 522/ L10	TBD	NA	--	1/ SDG	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
Pesticides	Eurofins Eaton	USEPA 505/ 525.2/ L11/12	TBD	NA	--	1/ SDG	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
Metals	Eurofins Eaton	USEPA 200.8/ L13/L14	TBD	NA	--	1/ SDG	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD

Analysis	Laboratory[1]	Analytical and Preparation SOP[2]	Estimated Environ. Sample Quantity	Field QC Analyses								Laboratory QC Sample						Total
				Trip Blank		Field Blank		Field Duplicate		Equipment Blank		MS		MSD[5]		Lab Duplicate[5]		
				Frequency (Freq.)	Number (No.)	Freq.	No.	Freq.[4]	No.	Freq.[4]	No.	Freq.[3]	No.	Freq.[3]	No.	Freq.[3]	No.	
Soil																		
PFAS	Eurofins	USEPA 537 Modified/1633/1633A L2/L46	TBD	NA	--	1/day	1	1/10	TBD	1/day	--	1/20	TBD	1/20	TBD	NA	--	TBD
VOCs	Eurofins	SW8260B/SW5035/ L4/L5	TBD	1/cooler	TBD	1/day	1	1/10	TBD	1/day	--	1/20	TBD	1/20	TBD	NA	--	TBD
SVOCs	Eurofins	SW8270D/ L9	TBD	NA	--	1/day	1	1/10	TBD	1/day	--	1/20	TBD	1/20	TBD	NA	--	TBD
Metals (including Mercury)	Eurofins Eaton	SW6020A/SW7470A L17/L18/L19	TBD	NA	--	1/day	1	1/10	TBD	1/day	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Total Organic Carbon	Eurofins	SW9060A/ Lloyd Kahn L36	TBD	NA	--	1/day	1	1/10	TBD	1/day	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Percent moisture	Eurofins	ASTM D2216/ L39	TBD	NA	--	1/day	1	1/10	TBD	1/day	--	NA	--	NA	--	1/20	TBD	TBD
Fish Tissue																		
PFAS	SGS AXYS	USEPA 537 Modified/ L42	TBD	NA	--	1/day	1	NA	--	1/day	--	1/20	TBD	1/20	TBD	NA	--	TBD
Percent moisture	Eurofins	ASTM D2216/ L39	TBD	NA	--	1/day	1	NA	--	NA	--	NA	--	NA	--	1/20	TBD	TBD
Waste Characterization																		
PFAS	Eurofins	USEPA 537 Modified/ L2	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
SPLP PFAS	Eurofins	SW1312/ USEPA 537 Modified/ L2/L40	TBD	NA	--	1/day	1	NA	--	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
VOCs	Eurofins	USEPA 624/ L3	TBD	1Cooler	TBD	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
SVOCs	Eurofins	USEPA 625/ L8	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	NA	--	TBD
Metals (including Mercury)	Eurofins Eaton	USEPA 200.8/245.1 L15/L19	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Alkalinity	Eurofins	SM 2320B/ L20	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD

Analysis	Laboratory[1]	Analytical and Preparation SOP[2]	Estimated Environ. Sample Quantity	Field QC Analyses								Laboratory QC Sample						Total
				Trip Blank		Field Blank		Field Duplicate		Equipment Blank		MS		MSD[5]		Lab Duplicate[5]		
				Frequency (Freq.)	Number (No.)	Freq.	No.	Freq.[4]	No.	Freq.[4]	No.	Freq.[3]	No.	Freq.[3]	No.	Freq.[3]	No.	
Ammonia	Eurofins	SM4500-NH3-G/ L21	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Anions (Bromide, Chloride, Fluoride, Sulfate	Eurofins	SW9056A/ L22	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Biological Oxygen Demand (5-day)	Eurofins	SM 5210B/ L23	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Carbonaceous Biological Oxygen Demand	Eurofins	SM 5210B/ L24	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Chemical Oxygen Demand	Eurofins	SM 5220C/ L25	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Chlorine	Eurofins	SW9251/ L26	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Flashpoint	Eurofins	SW1010A/ L27	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
HEM (Oil & Grease)	Eurofins	USEPA 1664B/ L28	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Hexavalent Chromium	Eurofins	SW7196A/ L29	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Nitrate as N/ Nitrite as N	Eurofins	SW9056A/ L30	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Ortho-Phosphate (As P)	Eurofins	SM 4500P-E/ L31	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Perchlorate	Eurofins	SW6860/ L32	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
pH	Eurofins	SM4500-H-B/ L33	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Total Dissolved Solids	Eurofins	SM 2540C/ L34	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Total Kjeldahl Nitrogen	Eurofins	SM4500NH3-G/ L35	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Total Organic Carbon	Eurofins	SW9060A/ Lloyd Kahn/ L36	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD
Total Phosphorus	Eurofins	SM4500-P-E/ L37	TBD	NA	--	1/day	1	1/10	TBD	NA	--	1/20	TBD	1/20	TBD	1/20	TBD	TBD

Analysis	Laboratory[1]	Analytical and Preparation SOP[2]	Estimated Environ. Sample Quantity	Field QC Analyses								Laboratory QC Sample						Total
				Trip Blank		Field Blank		Field Duplicate		Equipment Blank		MS		MSD[5]		Lab Duplicate[5]		
				Frequency (Freq.)	Number (No.)	Freq.	No.	Freq.[4]	No.	Freq.[4]	No.	Freq.[3]	No.	Freq.[3]	No.	Freq.[3]	No.	
Total Suspended Solids	Eurofins	SM 2540D/ L38	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD
Radionuclide Ra-226, Ra-228	Eurofins	USEPA 900,9031.0,904.0/ L43,L44,L45	TBD	NA	--	1/day	1	1/10	TBD	NA	--	NA	--	NA	--	1/20	TBD	TBD

Notes:
SDG = sample delivery group
[1] = See Worksheet #19 & #30 for contact information.
[2] = See Worksheet #23 for SOP title, revision number, and date details.
[3] = Frequency for MS, MSD, and laboratory duplicate samples is 1 per 20 field samples, not including field blanks.
[4] = Frequency for field duplicate samples is 1 per 10 field samples.
[5] = In the instance where both MSD and laboratory duplicate analysis are provided for sample analysis in table above, either the MSD or laboratory duplicate analysis will be performed as appropriate by laboratory.
[6] = Frequency of Field Duplicates and MS/MSDs will follow this table for sample delivery groups of ten or more; for smaller sample delivery groups, one field blank, field duplicate, and MS/MSD will be submitted per group.

QAPP Worksheet #21 – Field SOPs

Procedure # or Reference[1]	Title, Revision, and Date	Originating Organization	Procedure Option or Equipment Type (if procedure provides different options)[2]	Modified for Project? Y/N
P-01	Quality Procedure (QP) – Field Activities Documentation, Rev. 2, July 2023	Arcadis	Applies to all Arcadis field personnel.	N
P-02	TGI for Sample Chain of Custody, Rev. 3, March 2022	Arcadis	Applies to all Arcadis field personnel with 40-hour Hazardous Waste Operations and Emergency Response and Department of Transportation HazMat #1 training.	N
P-03	Health and Safety Standard – Utility Location and Clearance, Rev. 17, March 2020	Arcadis	Applies to all subsurface intrusive work.	N
P-04	QP – Calibration and Control of measuring and test equipment, Rev. 2, April 2024	Arcadis	Applies to all Arcadis field personnel using equipment that is capable of calibration.	N
P-05	QP – Field Sampling, Measurement, and Observation, Rev. 2, December 2022	Arcadis	Applies to all Arcadis field personnel completing field sampling, measurement, and observations.	N
P-06	TGI – Soil Description, Rev. 5, June 2024	Arcadis	Applies to all Arcadis field personnel conducting soil logging.	N
P-07	TGI – Monitoring Well Development, Rev. 2, April 2023	Arcadis	Applies to all Arcadis field personnel developing monitoring wells. See TGI for specific equipment needs.	N
P-08	TGI – Monitoring Well Inspection Assessment, Rev. 1, June 2022	Arcadis	See TGI for specific equipment needs. See TGI for specific equipment needs.	N
P-09	TGI – PFAS Potable Water Sampling Guidance, Rev. 3.1, March 2025	Arcadis	Applies to all Arcadis field personnel conducting potable water sampling. See TGI for specific equipment needs.	N
P-10	TGI – PFAS Field Sampling (all media) Guidance, Rev. 12, September 2023	Arcadis	Applies to all Arcadis field personnel collecting environmental samples for PFAS analysis. See TGI for specific equipment needs.	Y
P-11	TGI – Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells, Rev. 3, April 2023	Arcadis	Applies to low-flow sampling for PFAS.	Y
P-12	PFAS-Specific Drilling and Monitoring Well Installation TGI, Rev. 1, 26 March 2019	Arcadis	Applies to all Arcadis field personnel installing monitoring wells for PFAS analysis. See TGI for specific equipment needs.	N

Procedure # or Reference[1]	Title, Revision, and Date	Originating Organization	Procedure Option or Equipment Type (if procedure provides different options)[2]	Modified for Project? Y/N
P-13	TGI – Equipment and Reagent Blank Sample Collection for PFAS Analysis, Rev. 2.1, March 2025	Arcadis	Applies to all Arcadis field personnel completing field sampling. See TGI for specific equipment needs.	N
P-14	TGI – Vertical Aquifer Profiling (VAP) Sampling, Rev. 3.1, March 2025	Arcadis	Applies to all Arcadis field personnel using Vertical Aquifer Profiling to collecting soil and groundwater samples. See TGI for specific equipment needs.	N
P-15	TGI – Sediment, Surface Water, and Stormwater Sample Collection for PFAS Analysis, Rev. 4, May 2024	Arcadis	Applies to all Arcadis field personnel collecting sediment, surface water, and stormwater samples. See TGI for specific equipment needs.	N
P-16	TGI – Investigation-Derived Waste Handling and Storage, Rev. 1, May 2020	Arcadis	See TGI for specific equipment needs.	N

Notes:

[1] = Copies of the field SOPs are included in **Appendix A**.

[2] = For all TGIs pertaining to the collection of samples for PFAS analysis, there is concern that sampling for PFAS using sampling equipment manufactured from fluoropolymers could result in sample contamination. The materials of construction of all downhole and surface sampling and monitoring equipment — including pumps, packers, transducers, tubing, liners, valves, and wiring — should be free from polytetrafluorethylene or ethylene tetrafluoroethylene to the maximum extent practicable. In addition, well drilling procedures and completion materials should avoid the use of fluorocarbon-based lubricants, O-rings and pipe thread pastes, tapes and sealants. If possible, a confirmation letter with analytical testing results should be obtained from a manufacturer or service provider certifying that the equipment (or supplies) are free of any PFAS.

QAPP Worksheet #22 – Field Equipment Calibration, Maintenance, Testing, and Inspection

Instrument or Equipment	Description	Field Calibration Procedure	Performance Criteria	Responsible Personnel
Water Quality Meter – YSI 6-Series Multi-Parameter Instrument or Equivalent	Multi-parameter tool designed for field use with battery operation. Ranges: 0 – 14 pH -999 to +999 millivolt Oxidation-Reduction Potential -5 to 50 °C 0 to 50 mg/L Dissolved Oxygen 0 to 100 millisiemens per centimeter (mS/cm) Conductivity 0 to 1,000 nephelometric turbidity unit Turbidity	The unit is factory calibrated. Unit responsiveness will be checked prior to use each day with appropriate standards provided by the supplier. Unit responsiveness is checked against the solution standards provided by each manufacturer.	+/- 10% of included standard solutions with meter	Sample Collection Personnel (Arcadis)
Turbidimeter – Hach 2100P or Equivalent	Designed for field use with battery operation. Range: 0 to 1,000 nephelometric turbidity unit.	Each day prior to use, the turbidimeter is calibrated against the standard solutions provided by each manufacturer.	+/- 10% of included standard solutions with turbidimeter	Sample Collection Personnel (Arcadis)
4-Gas Meter – MultiRAE or Equivalent	Designed for field use with battery operation. Ranges: 0 to 100% Lower Explosive Limit (LEL) 0 to 100 parts per million (ppm) H_2S 0 to 30% (by volume) O_2 0 to 2,000 ppm CO 0 to 20,000 µRem/h Gamma 0.1 to 5,000 ppm VOC	Each day prior to use, the 4-Gas Meter is calibrated against clean (ambient) air and supplier-provided standard (mixed gas cannister).	+/- 10% of included standard gas value	Sample Collection Personnel (Arcadis)

QAPP Worksheet #23 – Analytical SOPs

SOP Reference Number	Title, Revision Date and/or Number[1,2,3]	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work (Yes or No)
L1	WS-DW-0004 Rev. 2.5: Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Analysis by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) [Methods 537 and 537.1], 1 November 2019	Definitive	PFAS (potable)	Liquid Chromatography/ Tandem Mass Spectrometry (LC/MS/MS)	Eurofins Sacramento	No
L2	WS-LC-0025 Rev. 4.0: PFAS in Water, Soils, Sediments and Tissue [Method 537 (Modified), Method PFAS by LCMSMS Compliant with Quality Systems Manual Table B-15, Revision 5.1 and higher], 23 September 2019	Definitive	PFAS (potable and non-potable)	LC/MS/MS	Eurofins Sacramento	No
L3	UP-MV-624, Rev.22: Gas Chromatography Mass Spec – Volatiles 40 Code of Federal Regulations Part 136 Method 624 (modified), 16 August 2019	Definitive	VOCs (potable water)	Gas Chromatography/ Mass Spectrometry (GC/MS)	Eurofins Chicago	No
L4	UP-MV-8260B,Rev.29: Gas Chromatography Mass Spectrometry – Volatiles SW-846 Method 8260B, 01 February 2019	Definitive	VOCs (non-potable water/solids)	GC/MS	Eurofins Chicago	No
L5	UP-SP-5035,Rev.17: Laboratory Handling, Transer and Preservation of VOA Soil Samples Received in EnCore[TM] Samplers for SW-846 Method 5035/5035A Low Concentration and 5030B, 30 November 2018	Definitive	VOCs in Soil/Sediment	NA – Sample preparation	Eurofins Chicago	No
L6	UP-MV-8260B,Rev.29: Gas Chromatography Mass Spectrometry – Volatiles SW-846 Method 8260B, 1 February 2019	Definitive	VOCs in Soil/Sediment	GC/MS	Eurofins Chicago	No
L7	UP-SP-3510,Rev.20: Sample Preparation Semivolatile and Nonvolatile Organic Compounds from a Wastewater or Leachate Matrix using Separatory Funnel Extraction, 31 July 2019	Definitive	SVOCs/PAHs (water)	NA – Sample preparation	Eurofins Chicago	No
L8	UP-MB-625,Rev.22: Gas Chromatography/Mass Spectrometry – Semi-Volatiles 40 Code of Federal Regulations Part 136, Method 625, 2 April 2019	Definitive	SVOCs/PAHs (Non-Potable water)	GC/MS	Eurofins Chicago	No

SOP Reference Number	Title, Revision Date and/or Number[1,2,3]	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work (Yes or No)
L9	UP-MB-8270D,Rev10: Gas Chromatography/Mass Spectrometry – Semi-Volatiles SW-846 8270D, 28 September 2018	Definitive	SVOCs (Non-potable water/solids)	GC/MS	Eurofins Chicago	No
L10	BR-MS-013,Rev0.1: 1,4-Dioxane in Water by GC/MS/SIM (Method 522 in drinking water), 18 June 2019	Definitive	1,4-Dioxane	GC/MS	Eurofins Burlington	No
L11[3]	LCGC-SOP17592: LCGC-505 (Revision 2.1)-Analysis of Organohalide Pesticides and Commercial Polychlorinated Biphenyl Products in Water by Micrextraction and Gas Chromatography, 9 August 2019	Definitive	Pesticides	Gas Chromatography/ Electron Capture Detector	Eurofins Eaton	No
L12[3]	GCMS-SOP18109: GCMS-EPA-525.2 Revision 2.0-Analysis of Select Semi-Volatile Organic Compounds in Water by Capillary Gas Chromatography/Mass Spectrometry Using Liquid-Solid Extraction, 23 Jaunary 2020	Definitive	Pesticides	GC/MS	Eurofins Eaton	No
L13[3]	MET-SOP18364: MET – Digestion of Metals Samples Using Hot Block Based on USEPA Method 200.2,rev.2.8, 29 August 2019	Definitive	Metals (potable)	NA – Sample preparation	Eurofins Eaton	No
L14[3]	MET-SOP-18362: MET-EPA 200.8 rev 5.4 Determination of Trace Elements in Water by AGILENT (ICP-MS), 2 October 2019	Definitive	Metals (potable)	Inductively Coupled Plasma (ICP)-MS	Eurofins Eaton	No
L15	UP-SP-200.0,Rev.27: Sample Preparation Metals Digestion by USEPA 200.7,200.8, 30 August 2019	Definitive	Metals (wastewater)	NA – Sample preparation	Eurofins Chicago	No
L16	UP-ME-200.8,Rev.14: Metals Analysis. Inductively Coupled Argon Plasma/Mass Spectrometry by USEPA 200.8 rev5.4, 2 August 2019	Definitive	Metals (wastewater)	ICP-MS	Eurofins Chicago	No
L17	UP-SP-3000,Rev.30: Sample Preparation Metals Digestion by SW-846 3000 Series, 30 August 2019	Definitive	Metals (non-potable water/solids)	NA – Sample preparation	Eurofins Chicago	No
L18	UP-ME-6020,Rev.13: Metals Analysis Inductively Coupled Argon Plasma/Mass Spectrometry by SW-846 6020/6020A (Update IV), 2 August 2019	Definitive	Metals (non-potable water/solids)	ICP/MS	Eurofins Chicago	No

SOP Reference Number	Title, Revision Date and/or Number[1,2,3]	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work (Yes or No)
L19	UP-ME-245.1,Rev25: Mercury by USEPA Methods 245.1; SW-846 7470A/7471A/7471B, 31 July 2019	Definitive	Mercury	Cold vapor atomic absorption (CVAA)	Eurofins Chicago	No
L20	UP-WC-Alkalinity,Rev.20: Wet Chemistry Alkalinity, 28 February 2019	Definitive	Alkalinity	Titration	Eurofins Chicago	No
L21	UP-WC-NH3_AutoPhenate,Rev.07: Wet Chemistry Total and Unionized Ammonia Automated Phenate Method, 2 April 2019	Definitive	Ammonia	Spectrophotometer	Eurofins Chicago	No
L22	UP-WC-300.0,Rev.20: Wet Chemistry Inorganic Ions by Ion Chromatography, 1 March 2019	Definitive	Anions (bromide, chloride, fuoride, sulfate)	Ion Chromatography (IC)	Eurofins Chicago	No
L23	UP-WC-BOD,Rev.27: Wet Chemistry Biochemical Oxygen Demand (BOD) & Carbonaceous BOD (cBOD), 4 February 2019	Definitive	BOD (5-day)	Dissolved Oxygen Meter	Eurofins Chicago	No
L24	UP-WC-BOD,Rev.27: Wet Chemistry BOD & cBOD, 4 February 2019	Definitive	cBOD	Dissolved Oxygen Meter	Eurofins Chicago	No
L25	UP-WC-COD,Rev.21: Wet Chemistry Chemical Oxygen Demand (COD), 30 November 2018	Definitive	COD	Spectrophotometer	Eurofins Chicago	No
L26	SA-GE-001,Rev7: Measurement of Analytes Using the KONELAB Analyzer, 4 December 2019	Definitive	Chlorine	Auto analyzer	Eurofins Savannah	No
L27	UP-WC-1010,Rev.22: Wet Chemistry Flash Point, 28 February 2019	Definitive	Flashpoint	Pensky-Martens Closed Cup	Eurofins Chicago	No
L28	UP-WC-1664,Rev.20: Wet Chemistry Oil & Grease / Total Recoverable Hydrocarbons (HEM / SGT-HEM), 3 July 2019	Definitive	HEM (Oil & Grease)	Analytical Balance	Eurofins Chicago	No
L29	UP-WC-3500CrB,Rev.23: Wet Chemistry Hexavalent and Trivalent Chromium, 30 November 2018	Definitive	Hexavalent Chromium	Spectrophotometer	Eurofins Chicago	No
L30	UP-WC-300.0,Rev.20: Wet Chemistry Inorganic Ions by Ion Chromatography, 1 March 2019	Definitive	Nitrate as N/ Nitrite as N	IC	Eurofins Chicago	No
L31	UP-WC-Phosphorus,Rev.22: Wet Chemistry Phosphorus and Ortho-Phosphorus, 4 February 2019	Definitive	Ortho-Phosphate (As P)	Spectrophotometer	Eurofins Chicago	No

SOP Reference Number	Title, Revision Date and/or Number[1,2,3]	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work (Yes or No)
L32	DV-LC-0024,Rev.11: Perchlorate in Water and Solids by IC/MS/MS [SW-846 Method 6860], 31 December 2019	Definitive	Perchlorate	IC/MS/MS	Eurofins Denver	No
L33	UP-WC-pH,Rev.22: Wet Chemistry pH, 4 February 2019	Definitive	pH	pH meter	Eurofins Chicago	No
L34	UP-WC-TDS,Rev.23: Wet Chemistry Total and Volatile Dissolved Solids, 4 February 2019	Definitive	Total Dissolved Solids	Analytical Balance	Eurofins Chicago	No
L35	UP-WC-TKN,Rev.06: Wet Chemistry Total Nitrogen by the Kjeldahl Method (TKN) By Automated Phenate, 28 February 2019	Definitive	TKN	Spectrophotometer	Eurofins Chicago	No
L36	UP-WC-TOC,Rev.20: Wet Chemistry Total Organic Carbon/Total Inorganic (Dissolved) Carbon, 19 April 2019	Definitive	Total Organic Carbon	Total Organic Carbon Analyzer	Eurofins Chicago	No
L37	UP-WC-Phosphorus,Rev.22: Wet Chemistry Phosphorus and Ortho-Phosphorus, 4 February 2019	Definitive	Total Phosphorus	Spectrophotometer	Eurofins Chicago	No
L38	UP-WC-TSS,Rev.22: Wet Chemistry Total and Volatile Suspended Solids, 28 February 2019	Definitive	Total Suspended Solids	Analytical Balance	Eurofins Chicago	No
L39	WS-OP-0013,Rev.4.2: Determination of Percent Moisture, 29 March 2013	Definitive	Total solids/Percent Moisture	Analytical Balance/ Calculation	Eurofins Sacramento	No
L40	WS-IP-0004,Rev.3.8: Toxicity Characteristic Leaching Procedure and Synthetic Precipitation Leaching Procedure [Methods 1311&1312], 16 September 2019	Definitive	SPLP/Toxicity Characteristic Leaching Procedure	NA – SPLP	Eurofins Sacramento	No
L41	BR-WC-008,Rev.16.0: Total Organic Carbon Lloyd Kahn Method, 17 January 2018	Definitive	Total Organic Carbon	GC flame ionization detector (GC-FID)	Eurofins Burlington	No
L42	SGS AXYS Method MLA-110: Analytical Procedure for the Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples, Solids, Tissues, AFFF Products, Blood/ Serums and Solvent Extracts by LC-MS/MS (rev 02, ver 08)[1], 02 October 2020	Definitive	PFAS	Ultra-Performance Liquid Chromatography (UPLC)/MS/MS	SGS AXYS	No

SOP Reference Number	Title, Revision Date and/or Number[1,2,3]	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work (Yes or No)
L43	SOP No. ST-RC-0041, Rev. 20: Radium-226 and Radium-228 By Chemical Separation Preparation, 06 April 2022	Definitive	Radium-226/228	Gas Flow Proportional Counting (GFPC)	Eurofins St. Louis	No
L44	SOP No. ST-RD-0403, Rev. 23: Low Background Gas Flow Proportional Counting (GFPC) System Analysis, 04 May 2022	Definitive	Radium-226/228	Gas Flow Proportional Counting (GFPC)	Eurofins St. Louis	No
L45	SOP No. ST-RC-0020, Rev. 2: Determination of Gross Alpha/Beta Activity, 08 March 2022	Definitive	Gross Alpha/Beta	Analytical Balance	Eurofins St. Louis	No
L46	WS-LC-0039: Analysis of Per- and Poly Polyfluoroalkyl Substances (PFAS) in Water, Solid, Biosolids and Tissue [Method 1633/1633A], Version 2.6, 24 January 2025	Definitive	PFAS (Water, Solid, Biosolids and Tissue)	LC/MS/MS	Eurofins Sacramento	No

Notes:

1 = SOPs are reviewed/revised by the laboratories on an annual basis. The SOPs included in the QAPP are current as of the date of the submittal. The current version of the laboratory SOP will be followed at the time of sample receipt.

2 = Copies of the SOPs are included in Appendix B.

3 =The laboratory SOPs are considered business confidential. Copies of the cover pages are included in Appendix B. Redacted copies will be provided upon request.

QAPP Worksheet #24 – Analytical Instrument Calibration

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
LC/MS/MS for PFAS (USEPA 537.1 and modified Method 537)	Mass Calibration	Daily, prior to sample analysis and after performing major maintenance, as required to maintain documented instrument sensitivity and stability performance.	Calibrate the mass scale of the MS with calibration compounds and procedures described by the manufacturer.	Retune instrument and peak check tune. Maintenance may be required.	Assigned Laboratory Personnel	L1/L2
	Instrument performance check (tune).	When the masses fall outside of the ± 0.5 atomic mass unit of the true value.	Mass assignments of the tuning standard within 0.5 atomic mass unit of true value.	Return instrument and verify		
	Initial Calibration (ICAL) Standards containing both branched and linear isomers must be used when commercially available and used to determine retention times (RTs). Midrange standard is used to establish RTs during ICAL, first CCV is used to establish RTs if no ICAL is performed. Isotope Dilution or Internal Standard Calibration is required.	Initial calibration prior to sample analysis and after any initial calibration verification (ICV) or CCV failure.	Signal to noise Ratio: ≥ 10:1 for all ions used for quantification. For PFOS and PFOA, the qualitative (confirmation) transition ion must have a signal to noise Ratio of ≥ 3:1. Average RF: Relative Standard Deviation (RSD) of the RFs for each analyte ≤ 20% Linear or non-linear Calibration: $r^2 \geq 0.99$. Do not force regressions through 0. Analyte concentrations must be within 70% to 130% of their true value for each calibration	Verify standard solutions still valid, perform instrument maintenance as needed, then repeat the ICAL. Sample analysis is not performed if ICAL fails. If ICV or CCV fails, two additional consecutive ICV or CCV standards may be analyzed. If both pass, then sample analysis can continue without a new ICAL. If a CCV fails high and there are no		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	Minimum five-point initial calibration for linear, or six-point calibration for quadratic (not including zero). Initial calibration blank (ICB)/ Continuing calibration blank (CCB) are performed after highest standard or after CCV.		standard, or 50-150% for lowest calibration standard. ICB, CCB ≤ ½ method reporting limit (MRL). Extracted internal standards (EIS) recoveries in calibration standards, ICB, CCB, between 50% and 150%.	detections in the associated samples, then analysis can proceed.		
	Instrument Sensitivity Check (ISC) and CCV. ISC can serve as initial daily CCV.	Prior to analysis and at least once every 12 hours. CCV to be performed initially, after every 10 field samples, and at end of each batch.	Analyte concentrations must be within 70% to 130% of their true value for each calibration standard, or 50-150% for lowest calibration standard. RTs should fall within 0.4 minutes of established absolute RTs.	Correct problem, rerun ISC. If problem persists, report ICAL.		
Liquid chromatography / tandem mass spectrometry (LC/MS/MS)	Mass Calibration	Initially prior to use and after performing major maintenance and if the masses fall outside of +/-0.35 amu, as required to maintain documented instrument sensitivity and stability performance.	Calibrate the mass scale of the MS with calibration compounds and procedures described by the manufacturer. Mass assignment within manufacturer’s specifications.	Retune instrument and verify. Rerun affected samples. Flagging criteria are not appropriate, and problem must be corrected.	Analyst, Department Manager	L46
	Mass Calibration Verification	A mass calibration verification must be performed following mass calibration,	Follow the instructions for their individual instrument software to confirm the mass	Retune instrument and verify. Rerun affected samples. Flagging criteria are		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
		prior to standards and samples analysis. Mass verification checks must also be performed after any subsequent mass calibrations.	calibration, mass resolution and peak relative response.	not appropriate, and problem must be corrected.		
	Initial Calibration (ICAL) Standards containing both branched and linear isomers must be used when commercially available. Isotope Dilution or Internal Standard Calibration is required. Minimum six-point initial calibration for linear, or seven-point calibration for quadratic.	Initial calibration prior to sample analysis	S/N Ratio: ≥ 3:1 for all ions used for quantification. For analytes having a primary or secondary transitions. S/N Ratio: ≥ 10:1 for all ions used for quantification. For analytes that only have a single transition. Average RF option 1: RSD of the RFs for each native and labeled analyte ≤ 20%. Average RF option 2: RSE of each native and labeled analyte in every calibration point ≤ 20%. Linear or non-linear Calibration: $r^2 \geq 0.99$. RSE of each native and labeled analyte in calibration point ≤ 20%.	Verify standard solutions still valid, perform instrument maintenance as needed, then repeat the ICAL.		
	Retention Time Window	Every field sample, standard, blank and QC sample	For all method analytes with exact corresponding isotopically labeled analogs, method analytes must elute within ± 0.1 minutes of the	When ICAL is not performed, the ICV retention times or the midpoint standard of the ICAL curve can		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
			associated extracted internal standard (EIS). The retention times of each native and isotopically labeled compound must be within ± 0.4 minutes of the ICAL or ICV used to establish the retention time windows for the samples and batch QC.	be used to establish the retention time window position Correct the problem and reanalyze the samples.		
	Ion Ratio	All analytes detected in a sample	Must meet all of the requirements (± 50 % initial calibration mid-point).	Recalibrate if acceptance criteria are not met.		
	Instrument Sensitivity Check (ISC). ISC can serve as initial daily CCV	Prior to analysis and at least once every 12 hours.	ISC at concentration of lowest initial calibration standard; All analyte concentrations within ±30% of true value; Signal-to-noise greater than or equal to 3:1.	If the signal-to-noise ratio requirements cannot be met, the problem must be corrected before analyses can proceed. Correct problem, rerun ISC. If problem persists, repeat ICAL.		
	Initial Calibration Verification (ICV)	Once after each ICAL; analysis of second source standard prior to sample analysis.	Analyte concentrations must be within ±30% of true value.	Correct problem, rerun ICV. If problem persists, report ICAL.		
	Bile Salt Standards	Daily prior to analysis of all matrices	The retention time of the bile salt(s) peak must be resolved from PFOS (both linear and	Not Applicable.		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
			branched isomers) by at least one minute.			
	Branched Linear RT Check	Daily prior to analysis of all matrices.	Presence of branched compounds.	Not Applicable.		
	Continuing Calibration Verification (CCV)	Prior to sample analysis, after every 10 field samples, and at end of analytical sequence.	Analyte concentrations must be within ±30% of true value. Concentration of analytes must range from LOQ to mid-level calibration concentrations.	Immediately analyze two additional consecutive CCVs. If both pass, samples may be reported without reanalysis. Otherwise, perform corrective action, repeat CCV (or ICAL) and reanalyze all associated samples since last successful CCV.		
	Instrument Blanks	Immediately following highest standard analyzed, daily prior to sample analysis, after each CCV.	Concentration of each analyte must be ≤ ½ the LOQ.	If acceptance criteria are not met after the highest calibration standard, calibration must be performed using a lower high standard until criteria is met.		
GC/MS for VOCs USEPA 624/SW8260B	Instrument performance check (tune).	Prior to initial and continuing calibration.	As per method.	Retune instrument.	Assigned Laboratory Personnel	L3/L4/L5/L6
	Initial calibration — prior to sample analysis, a minimum of	Prior to sample analysis five points for all compounds. Yearly.	Each compound relative response factor (RRF) RSD ≤ 15% (SW8260B) and <35% (USEPA 624) for all	Inspect system, correct problem, rerun calibration and affected samples if		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	five concentration levels for all compounds.		compounds or linear $r^2 \geq 0.99$ and RRF ≥ 0.05.	RSD >50% or linear $r^2 \geq 0.99$.		
	Continuing calibration — before sample analysis, one standard (midpoint).	Before sample analysis and every 12 hours.	SW8260B = each compound percent difference ≤20%. USEPA 624 = (See Table 5 located in USEPA Method 624) for all compounds or linear and response factor (RF) ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if %D >80%.		
GC/MS for PAHs/SVOCs USEPA 625/ SW8270D	Instrument performance check (tune).	Prior to initial and continuing calibration.	As per method.	Retune instrument.	Assigned Laboratory Personnel	L7/L8/L9
	Initial calibration — prior to sample analysis, a minimum of five concentration levels for all compounds.	Prior to sample analysis, five points for all compounds. Yearly.	SW8270D = RRF RSD ≤15% USEPA 625 = ≤35% for all compounds or linear $r^2 \geq 0.99$ and RRF ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if RSD > 50% or linear $r^2 \geq 0.99$.		
	Continuing calibration — before sample analysis, one standard.	Before sample analysis and every 12 hours.	Each compound %D ≤20% (SW8270D and USEPA 625) for all compounds or linear and RF ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if %D> 80%.		
GC/MS for 1,4-Dioxane USEPA 522	Instrument performance check (tune).	Prior to initial and continuing calibration.	As per method.	Retune instrument.	Assigned Laboratory Personnel	L10
	Initial calibration — prior to sample analysis, a minimum of five concentration levels for all compounds.	Prior to sample analysis, five points for all compounds. Yearly.	RRF RSD ≤15% for all compounds or linear $r^2 \geq 0.99$ and RRF ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if RSD > 50% or linear $r^2 \geq 0.99$.		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	Continuing calibration — before sample analysis, one standard.	Before sample analysis and every 12 hours.	Each compound %D ≤30% for all compounds or linear and RF ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if %D> 80%.		
GC/MS for Pesticides USEPA 525.2	Instrument performance check (tune).	Prior to initial and continuing calibration.	As per method.	Retune instrument.	Assigned Laboratory Personnel	L12
	Initial calibration — prior to sample analysis, a minimum of five concentration levels for all compounds.	Prior to sample analysis, five points for all compounds. Yearly.	RRF RSD ≤30% for all compounds or linear r^2 ≥0.99 and RRF ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if RSD > 50% or linear $r^2 \geq 0.99$.		
	Continuing calibration — before sample analysis, one standard.	Before sample analysis and every 12 hours.	Each compound %D ≤30% for all compounds or linear and RF ≥0.05.	Inspect system, correct problem, rerun calibration and affected samples if %D> 80%.		
ICP-MS for Metals USEPA 200.8/SW6020A	Linear Dynamic Range or high-level check standard.	At initial set up and checked every 6 months.	Within 10% of true value	Dilute samples within the calibration range or re-establish/verify the Linear Dynamic Range.	Assigned Laboratory Personnel	L13 through L18
	Tune	Prior to ICAL.	Mass calibration ≤ 0.1 amu from the true value; resolution < 0.9 amu full width at 10% peak height	Retune instrument and verify.		
	ICAL	Daily prior to sample analysis.	r^2 ≥0.998	Recalibrate.		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	ICV	Once after each ICAL, prior to sample analysis.	Value of second source for all analytes within ±10% of expected value.	Recalibrate.		
	Calibration verification (CV)	After every 10 samples and at the end of the analysis sequence.	All analytes within ±10% of expected value.	Recalibrate, rerun 10 samples previous to failed CV.		
	Low-level Calibration Check Standard	Daily.	All analytes within ±20% of expected value.	Correct problem then repeat ICAL.		
	Interference Check Solutions (ICS)	After ICAL and prior to sample analysis.	ICS-A: Absolute value of concentration for all non-spiked project analytes <RL ICS-AB: within ±20% of expected value.	Terminate analysis, locate and correct problem, reanalyze ICS and all samples.		
CVAA for Mercury USEPA 245.1/SW7470A/SW 7471B	Initial calibration — five concentration levels. Continuing calibration — one standard.	Daily, or on continuing calibration failure. Continuing, every 10 samples.	Initial calibration - ≥0.995 coefficient of variation. Continuing calibration — +/-20% difference for SW740A/SW7471B and +/-10% difference for USEPA 245.1. Low-level check continuing calibration — +/-30% difference (SW7470A/SW7471B only).	Inspect system, correct problem, rerun calibration and affected samples.	Assigned Laboratory Personnel	L19

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
GC/electron capture detector for Pesticides (USEPA 505)	Initial calibration — prior to sample analysis, a minimum of five concentration levels for all compounds.	After initial calibration, a check standard mixture is analyzed every 12-hour shift with the continuing calibration standard, which is analyzed after every 20 samples or end of sequence.	Each compound calibration factor ≤20% for all compounds or linear r^2 ≥0.99.	Inspect system, correct problem, rerun calibration and affected samples if calibration factor >20% or linear r^2 ≥0.99.	Assigned Laboratory Personnel	L11
	Continuing calibration — before sample analysis, one standard (midpoint).	Pesticide mixture is analyzed every 12-hour shift with the continuing calibration standard, which is analyzed after every 20 samples or end of sequence.	Each compound %D ≤20%.	Inspect system, correct problem, rerun calibration and affected samples if %D >15%.		
Autoanalyzer for Total Organic Carbon (SW9060A)	ICAL	Daily prior to sample analysis.	r^2 ≥0.995.	Recalibrate.	Assigned Laboratory Personnel	L36
	ICV	Once after each ICAL, prior to sample analysis.	Within ±10% of expected value.	Recalibrate.		
	CV	After every 10 samples and at the end of the analysis sequence.	Within ±10% of expected value.	Recalibrate, rerun 10 samples previous to failed CV.		
Colorimetric Spectrophotometer	ICAL	Daily prior to sample analysis.	r^2 ≥0.995.	Recalibrate.	Assigned Laboratory Personnel	L26

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
for Chlorine (SW9251)	ICV	Once after each ICAL, prior to sample analysis.	Within ±10% of expected value.	Recalibrate.		
	CV	After every 10 samples and at the end of the analysis sequence.	Within ±10% of expected value.	Recalibrate, rerun 10 samples previous to failed CV.		
IC for Bromide/Chloride/ Fluoride/Sulfate (SW9056A)	ICAL	Weekly prior to sample analysis.	r^2 ≥0.995.	Recalibrate.	Assigned Laboratory Personnel	L22/L30
	ICV	Once after each ICAL, prior to sample analysis.	Within ±10% of expected value.	Recalibrate.		
	CV	After every 10 samples and at the end of the analysis sequence.	Within ±10% of expected value.	Recalibrate, rerun 10 samples previous to failed CV.		
Titration for Alkalinity (SM2320B)	CV	Prior to sample analysis.	RSD 20%	Recalibrate and rerun samples.	Assigned Laboratory Personnel	L20
Spectrophotometer for Ammonia/Hexavalent Chromium/Ortho-Phosphate/Total Phosphorus/TKN/ Nitrate/Nitrite as N (SM4500-NH3-G/SM4500P-E/SM 4500NH3-G/SW9056A)	ICAL	Daily prior to sample analysis.	r^2 ≥0.995.	Recalibrate.	Assigned Laboratory Personnel	L21/L29//L 30/L31/L33 /L35
	ICV	Once after each ICAL, prior to sample analysis.	Within ±10% of expected value.	Recalibrate.		
	CV	After every 10 samples and at the end of the analysis sequence.	Within ±10% of expected value.	Recalibrate, rerun all samples previous to failed CV.		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
Gravimetric for HEM Oil & Grease (USEPA 1664B)	Calibration check	Prior to sample analysis.	RSD 10%	Recalibrate and rerun samples.	Assigned Laboratory Personnel	L28
pH Electrode for pH (SM4500-H-B)	ICAL	Prior to sample analysis.	pH readings of 4, 7, and 10 buffer solutions must be within ±0.05.	Recalibrate.	Assigned Laboratory Personnel	L33
	CV	After every 10 samples and at the end of the analysis sequence.	pH reading of 7 buffer solution must be within ±0.05.	Recalibrate, rerun samples bracketed by failing CV.		
Spectrophotometer for Carbonaceous COD/COD (SM5210B/5220C)	Digest and analyze a 20 ppm and 50 ppm calibration standards (low level) or a 150 ppm and 750 ppm calibration standards (mid-level)	Daily.	20ppm standard within ±30% recovery; 50ppm, 150ppm, and 750ppm standards within ±10% recovery.	Inspect system, correct problem, rerun calibration and affected samples.	Assigned Laboratory Personnel	L24/L25
Dissolved Oxygen Meter for BOD (SM5210B)	Autocalibration	Daily.	Compare calibration against Winkler titration.	Perform a manual calibration per the instrument manual.	Assigned Laboratory Personnel	L23
Pensky-Martens Closed Cup	ICAL	Yearly.	Thermometers and rotation apparatus verified annually.	Maintenance required.	Assigned Laboratory Personnel	SW1010A L27
	Calibration check	Prior to running samples.	The flash point of check standard (p-xylene) must be obtained within a value of 27.2 ± 1.1ºC.	Rerun check.		
	CV	Every 10 samples.	27.2 ± 1.1ºC.	Recalibrate, rerun samples bracketed by failing CV.		

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
GC/FID Lloyd Kahn	Initial calibration — five concentration levels. Continuing calibration — every 20 samples.	Daily, or on continuing calibration failure. Continuing, every 20 samples.	Initial calibration - ≥0.995 coefficient of variation. Continuing calibration — +/- 25% difference.	Inspect system, correct problem, rerun calibration and affected samples.	Assigned Laboratory Personnel	L41
Gas Flow Proportional Counter	Initial Calibration - Voltage Plateau (ICALV) (separate plateaus determined for alpha and beta activity)	Prior to initial use and after loss of control.	Slope of the plateau less than 5% over a range of 100V.	Correct problem, then repeat ICALV.	Lab Manager / Analyst	ST-RD-0403 L-18/L-20
	Initial Calibration - Efficiency (ICALE)	Prior to initial use, after loss of control, and upon incorporation of new or changed instrument settings.	Verify manufacturer's specifications for detector efficiency for both alpha and beta counting modes using electroplated sources.	Correct problem, then repeat ICALE.	Lab Manager / Analyst	ST-RD-0403
	Initial Calibration – Cross-talk Factors (ICALCT)	Prior to initial use, after loss of control, and upon incorporation of new or changed instrument settings.	Verify manufacturer's specifications for cross talk in alpha and beta channels.	Correct problem, then repeat ICALCT.	Lab Manager / Analyst	ST-RD-0403
	Initial Calibration – Self-Absorption Curve (ICALSA)	Prior to initial use, after loss of control, and upon incorporation of new or changed instrument settings.	Best fit of data with correlation coefficient closest to 1.00 and the smallest error.	Correct problem, then repeat ICALSA.	Lab Manager / Analyst	ST-RD-0403

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference
	Efficiency Calibration Verification (IECV)	After ICALE for alpha and beta and prior to analysis of samples.	Value of second source calibration for each isotope within ±10% of initial calibration value.	Correct problem and verify second source standard. Rerun IECV. If that fails, correct problem and repeat ICALE.	Lab Manager / Analyst	ST-RD-0403
	Continuing Calibration Verification (CCV)	After a counting gas change and daily for short test-source counting intervals.	Within tolerance or control chart limits ± 3% or 3σ of the mean.	Correct problem, rerun calibration verification. If that fails, then repeat ICALE. Reanalyze all samples since the last successful calibration verification.	Lab Manager / Analyst	ST-RD-0403

Note:
%D = percent difference

QAPP Worksheet #25 – Analytical Instrument and Equipment Maintenance, Testing, and Inspection

Instrument/ Equipment	Maintenance Activity[1,2]	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[3]
LC/MS/MS	See Note 9	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	USEPA 537.1/Modified 537/1633/1633A L1/L2,L42/L46
GC/MS	See Note 9	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	USEPA 22/525.2/624/ 625/SW8260B/8270D L3 through L10/L12
ICP-MS	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	USEPA 200.8/SW6020A L13 through L18
CVAA	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	USEPA 245.1/SW7470A/SW7471B L19
GC/electron capture detector	See Note 9	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	USEPA 505 L11
Autoanalyzer	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	Chlorine L26
Total Organic Carbon Analyzer	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	SW9060A L36
IC	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	SW9056A L22/L30
Pensky-Martens Closed Cup	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	SW1010A L27

Instrument/ Equipment	Maintenance Activity[1,2]	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[3]
pH Electrode	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	SM4500-H-B L28
Titration	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	SM4500-NH3-G L21
Spectrophoto meter	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	SM4500-NH3-G/SM4500P-E/SM 4500NH3-G/SW9056A L21/L29//L30/L31/L33/L35
Gravimetric	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	USEPA 1664B L28
Gamma Spectroscopy	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	EPA 901.1 L-17
Alpha Spectroscopy	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	ST-RD-0403 L-18/L-20
Gas-Proprtional Counting System	See Note 4	See Note 5	See Note 6	See Note 7	Per lab SOPs	See Note 8	Assigned Laboratory Personnel	EPA 900.0/903.0/904.0 L-21/L-22/L-23/L-24

Notes:
[1] = The maintenance of the analytical instruments, including the testing activity, inspection activity, frequency, acceptance criteria, responsible person and SOP reference must be documented in the Laboratory's QC Manual.
[2] = Spare parts and maintenance of laboratory analytical instrumentation are the responsibility of the assigned laboratory.
[3] = If a backup laboratory is assigned, the SOPs may differ.
[4] = Check instrument components per instrument manual and assigned laboratory SOP.
[5] = Check instrument calibration parameters per SOP.
[6] = Inspect instrument components per SOPs and Manuals.
[7] = Prior to analyses and per laboratory SOPs.
[8] = Investigate, correct problem and re-calibrate if necessary.
[9] = Check instrument components such as columns and injection posts per instrument manual and assigned lab SOP.

QAPP Worksheet #26 & 27 – Sample Handling, Custody, and Disposal

Sampling Organization: Arcadis

Laboratory: Eurofins; SGS AXYS for fish tissue

Method of sample delivery: FedEx or UPS for overnight delivery or courier to the laboratory

Number of days from reporting until sample disposal: At least 60 days after delivery of final report

Activity	Organization and title or position of person responsible for the activity	SOP Reference
Sample labeling	Field Team Leader (FTL), Arcadis	Field SOP P-01 QP – Field Activities Documentation and P-02 SOP - Sample Chain of Custody; additional guidance in Field SOP P-10 TGI - Poly- and PFAS Field Sampling (all media) Guidance Sample identification by project activity is described below.
Chain-of-Custody (COC) form completion	FTL, Arcadis	Field SOP P-01 QP – Field Activities Documentation and P-02 SOP - Sample Chain of Custody; for PFAS analyses, clearly indicate which method and the desired analyte list (e.g., "Mod 537, Groundwater - WDNR list of 36")
Packaging	FTL, Arcadis	Field SOP P-01 QP – Field Activities Documentation and P-02 SOP - Sample Chain of Custody; additional guidance in Field SOP P-10 TGI - PFAS Field Sampling (all media) Guidance
Shipping Coordination	FTL, Arcadis	Field SOP P-01 QP – Field Activities Documentation and P-02 SOP - Sample Chain of Custody; additional guidance in Field SOP P-10 TGI - PFAS Field Sampling (all media) Guidance
Sample receipt, inspection, and log-in	Sample Custodian, Eurofins or SGS AXYS	See "Laboratory Custody Procedures" below.
Sample custody and storage	Sample Custodian, Eurofins or SGS AXYS	See "Laboratory Custody Procedures" and "Final Evidence Files" below.
Sample disposal	Sample Custodian, Eurofins a or SGS AXYS	See Laboratory QA Manual and/or Sample Disposal SOP.

Sample Identification System

The sample identification nomenclature consists of the components described below. Sampling dates are added as a field connected to each sample when imported into the sampling database.

Private potable well samples are labeled as follows:

- **FTC Private Wells:**
  - WS-XXX, where WS = water sample and XXX = the number assigned to the well.
- **FTC Private Deep Wells:**
  - WS-XXXR, where WS = water sample; XXX = the number assigned to the well; R indicates replacement.
  - WS-XXXR-POST, where POST indicates sample collected after treatment.
- **FTC Private Wells with POETs:**
  - WS-XXX, where WS = water sample and XXX = the number assigned to the well.
  - POET-YY-MID, where POET = point of entry treatment system sample, YY = the number assigned to the POET system not equivalent to the well number, and MID = midpoint of POET system sampling location.
  - POET-YY-POST, where POET = point of entry treatment system sample, YY = the number assigned to the POET system not equivalent to the well number, and POST = post-POET system sampling location.
- **Private Wells Adjacent to the Land Applied Biosolids Fields:**
  - BWS-XXX, where BWS = biosolids water sample and XXX = the number assigned to the well.
- **Quality Control Samples:**
  - Field Duplicates: DUP-ZZZ, where DUP = duplicate and ZZZ = the number of the duplicate assigned programmatically. The Field notes indicate the identity of the parent sample.
  - Field Blanks: Field Blank-MM-DD-YYYY, where MM-DD-YYYY are month-day-year.
  - MS/MSDs: Same name as parent. Indicate MS/MSD on COC form.

The GETS and Ditch A & B Treatment Systems are labeled according to their unique identification number:

- **GETS Operation Samples:**
  - SPX – where X = unique numerical location identifier, 1-9
- **GETS Extraction Well Samples:**
  - EX-X – where X = unique numerical location identifier, 1-13
- **Ditch A Treatment System Samples:**
  - V-XXX-A – where XXX = unique numerical location identifier and A refers to Ditch A.
- **Ditch B Treatment System Samples:**
  - SC-XXX-B – where XXX = unique numerical location identifier and B refers to Ditch B.

Environmental investigation samples are labeled as follows:

- **Surface water ditches and pond samples, including Quality Control Samples:**
  - SW-XX-MM-DD-YYYY, where SW = surface water, XX = unique numerical location identifier, and MM-DD-YYYY are month-day-year.
  - SW-FTC-XX-MM-DD-YYY, where SW = surface water, FTC = Fire Technology Center indicating the sample is on Tyco property, and XX = unique numerical location identifier, and MM-DD-YYYY are month-day-year.
  - Field Duplicates: DUP-ZZ, where DUP = duplicate and ZZ = the number of the duplicate assigned programmatically, not the number of the parent sample. The Field notes indicate the identity of the parent sample.
  - Field Blanks: Field Blank-MM-DD-YYYY, where MM-DD-YYYY are month-day-year.
  - Equipment Blanks: EB-XX, where EB is equipment blank, and XX = unique numerical location identifier.
  - MS/MSDs: Same name as parent. Indicate MS/MSD on COC.
- **Sediment Samples, including Quality Control Samples:**
  - SD-XX, where SD = sediment, and XX = unique numerical location identifier.
  - Field Duplicates: DUP-ZZ, where DUP = duplicate and ZZ = the number of the duplicate assigned programmatically, not the number of the parent sample. The Field notes indicate the identity of the parent sample.
  - Field Blanks: FB-XX, where XX = unique numerical location identifier.
  - Equipment Blanks: EB-XX, where EB is equipment blank, and XX = unique numerical location identifier.
  - MS/MSDs: Same name as parent. Indicate MS/MSD on COC.
- **Soil Samples, including Quality Control Samples:**
  - SS-XXX (AA-BB), where SS is soil sample, XXX = unique numerical location identifier, AA = top of sample depth in feet, and BB = bottom of sample depth in feet.
    - Paired soil leaching samples, which are aqueous, have the same sample IDs as their parent soil sample.
  - Field Duplicates: DUP-ZZ, where DUP = duplicate and ZZ = the number of the duplicate assigned programmatically, not the number of the parent sample. The Field notes indicate the identity of the parent sample.
  - Field Blanks: Field Blank-MM-DD-YYYY, where MM-DD-YYYY are month-day-year.
  - Equipment Blanks: Equipment Blanks: EB-XX, where EB is equipment blank, and XX = unique numerical location identifier.
  - MS/MSDs: Same name as parent. Indicate MS/MSD on COC.
- **Groundwater Samples, including Quality Control Samples:**
  - VAP-XXX (AA-BB), where VAP is vertical aquifer profile, XXX = unique numerical location identifier, AA = top of sample depth in feet, and BB = bottom of sample depth in feet.
  - MW-XXX-CC, where MW is monitoring well, XXX = unique numerical location identifier, and CC = bottom of screen depth in feet; note not all samples include the “-CC” component.

- PW-XXX, where PW is production well and XXX = unique numerical location identifier.
- PZ-XXX, where PZ is piezometer and XXX = unique numerical location identifier.
- Field Duplicates: DUP-ZZ, where DUP = duplicate and ZZ = the number of the duplicate assigned programmatically, not the number of the parent sample. The Field notes indicate the identity of the parent sample.
- Field Blanks: Field Blank-MM-DD-YYYY, where MM-DD-YYYY are month-day-year.
- Equipment Blanks: EB-XX, where EB is equipment blank, and XX = unique numerical location identifier.
- MS/MSDs: Same name as parent. Indicate MS/MSD on COC.

- **Fish Tissue Samples:**
  - SW-XX-SP-YY-OR-ZZ, where SW-XX is the pond the fish was collected from, SP-YY is the species number, and OR-ZZ is the organism unique numerical identifier. This sample identifier will be used for the collection of fish.
    - For example, SW-14-SP-1-OR-02 is a fish collected from pond SW-14, species 1 (for example, brown bullhead catfish), the second catfish that was collected from pond SW-14.For example, SW-14-SP-2-OR-03 is a fish collected from pond SW-14, species 2 (for example, bluegill sunfish), the third sunfish that was collected from pond SW-14.
  - FI-XX-SW-YY-SP-ZZ, where FI is fish tissue, XX is unique numerical identifier, SW-YY is the pond the fish was collected from, and SP-ZZ is the species number. This sample will be the filleted sample analyzed by the lab. Fillet samples may be a composite of multiple organisms, if needed for adequate sample mass.
    - For example, FI-01-SW-14-SP-3 is fish sample 1, collected from pond SW-14, from species 3 (e.g., yellow perch).
  - MS/MSDs: Same name as parent. Indicate MS/MSD on COC.

Laboratory Custody Procedures

Each laboratory will have a sample custodian who accepts custody of the samples and verifies that the information on the sample labels matches the information on the COC. The sample custodian will document any discrepancies and will sign and date all appropriate receiving documents. The sample custodian will also document the condition of the samples upon receipt at the laboratory. If a sample container is missing, a sample container is received broken, the sample is in an inappropriate container, or the sample has not been preserved by appropriate means, Arcadis personnel will be notified as per direction in **Worksheet #6**.

In accordance with laboratory custody and security requirements, the laboratory sample custodian will be responsible for logging the samples in, assigning a unique laboratory identification number to each sample to assure traceability of samples while in possession of the laboratory, labeling the sample bottle with the laboratory identification number, and moving the sample to an appropriate storage location to await analysis. The project name, field sample code, date sampled, date received, analysis required, storage location and date, and action for final disposition will be recorded in the laboratory tracking system. Relevant custody documentation will be placed in the project file.

The following stages of analysis must be documented by the laboratory:

- Sample extraction/preparation

- Sample analysis
- Data reduction
- Data reporting

Laboratory personnel are responsible for the custody of the samples until they are returned to the sample custodian.

Final Evidence Files

This is the final phase of sample custody. The COC records and sample analysis request form copies are archived in their respective project files. Laboratory custody forms, sample preparation and analysis logbooks, and data packages will become part of the laboratory final evidence file. Other relevant documentation including records, reports, correspondence, logs, pictures, and data review reports will be archived by Arcadis personnel.

Sample Holding Times

Information on sample holding times and required preservation for each test method are provided in **Worksheet #19 & 30**.

QAPP Worksheet #28-1 – Analytical Quality Control and Corrective Action – PFAS (Water – Potable)

Matrix	Water					
Analytical Group	PFAS					
Analytical Method/SOP Reference	USEPA 537.1/1633/1633A Per laboratory SOP L1/L46					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Internal Standards	Three Internal Standards added to every field sample, standard, blank, and QC sample.	See Worksheet #12-1	If Internal Standards areas are unacceptable, analyze a second aliquot of extract if enough remains. If second analysis meets acceptance criteria, report the second analysis. If it fails, either analysis may be reported with the appropriate flags.	Laboratory analyst	Accuracy/Bias	See Worksheet #12-1
Method blank	1 per analytical batch of no more than 20 samples.	See Worksheet #12-1	Correct problem. If required, reprep and reanalyze method blank and all QC samples and field samples processed with the contaminated blank.	Laboratory analyst	Contamination/ Bias	See Worksheet #12-1
LCS	1 per analytical batch of no more than 20 samples.	See Worksheet #12-1	Correct problem, then re-prep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes if sufficient sample material is available.	Analyst / Section Supervisor	Accuracy/Bias	See Worksheet #12-1
MS / MSD	1 per analytical batch of no more than 20 samples.	See Worksheet #12-1	If criteria not met, qualify as appropriate.	Analyst / Section Supervisor	Accuracy/bias	See Worksheet #12-1
Surrogates	Three surrogates added to every field sample, standard, blank, and QC sample.	See Worksheet #12-1	If recoveries are acceptable for QC samples, but not field samples, may indicate matrix effect. If QC samples fail, correct problem; rerun all failed samples, report and narrate.	Analyst / Section Supervisor	Accuracy/bias	See Worksheet #12-1
Field duplicate	One per 10 field samples.	See Worksheet #12-1	Qualify data.	Data validator	Precision	See Worksheet #12-1

QAPP Worksheet #28-2 – Analytical Quality Control and Corrective Action – PFAS (Potable and Non-Potable Water)

Matrix	Water					
Analytical Group	PFAS and SPLP PFAS					
Analytical Method/SOP Reference	USEPA Modified 537/1633/1633A Per laboratory SOP L2/L40/L46					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria[1]**
Injection Internal Standards	Added to all field samples, standards, and QC samples.	See Worksheet #12-2, 3, 15	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Accuracy	See Worksheet #12-2, 3, 15
Method Blank	One per preparatory batch.	See Worksheet #12-2, 3, 15	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-2, 3, 15
LCS	One per preparatory batch.	See Worksheet #12-2, 3, 15	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-2, 3, 15
MS/MSD	One per preparatory batch.	See Worksheet #12-2, 3, 15	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/Accuracy	See Worksheet #12-2, 3, 15

Matrix	Water					
Analytical Group	PFAS and SPLP PFAS					
Analytical Method/SOP Reference	USEPA Modified 537/1633/1633A Per laboratory SOP L2/L40/L46					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria[1]**
Extractable Internal Standards	Added to all field and QC samples.	See Worksheet #12-2, 3, 15	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the assoicated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-2, 3, 15
Field duplicate	One per 10 field samples.	See Worksheet #12-2, 3, 15	Qualify data.	Data validator	Precision	See Worksheet #12-2, 3, 15

Note:

[1] = The requirements for Measurement Performance Criteria are consistent with the requirements established in Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations- Version 12.16.2019 (WDNR 2019).

QAPP Worksheet #28-3 – Analytical Quality Control and Corrective Action – PFAS (Solids and Fish Tissue)

Matrix	Solids and Fish Tissue					
Analytical Group	PFAS					
Analytical Method/SOP Reference	USEPA Modified 537/1633/1633A Per laboratory SOP L2/L46 (solids) Per laboratory SOP L42/L46 (fish tissue)					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria[1]**
Injected Internal Standards	Added to all field samples, standards, and QC samples.	See Worksheet #12-4	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Accuracy	See Worksheet #12-4
Method Blank	One per preparatory batch.	See Worksheet #12-4	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-4
LCS	One per preparatory batch.	See Worksheet #12-4	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-4
MS/MSD[2]	One per preparatory batch.	See Worksheet #12-4	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/Accuracy	See Worksheet #12-4

Matrix	Solids and Fish Tissue					
Analytical Group	PFAS					
Analytical Method/SOP Reference	USEPA Modified 537/1633/1633A Per laboratory SOP L2/L46 (solids) Per laboratory SOP L42/L46 (fish tissue)					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria[1]**
Extracted Internal Standards	Added to all field and QC samples.	See Worksheet #12-4	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-4
Field duplicate[2]	One per 10 field samples.	See Worksheet #12-4	Qualify data.	Data validator	Precision	See Worksheet #12-4

Notes:

[1] = The requirements for Measurement Performance Criteria are consistent with the requirements established in Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations- Version 12.16.2019 (WDNR 2019).

[2] = Field duplicates do not apply to fish tissue samples.

QAPP Worksheet #28-4 – Analytical Quality Control and Corrective Action (Volatile Organic Compounds in Water)

Matrix	Water					
Analytical Group	VOCs					
Analytical Method/SOP Reference	USEPA 624/SW8260B Per laboratory SOP L3/L4					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Internal Standards	Added to all field samples, standards, and QC samples.	See Worksheet #12-5	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Accuracy	See Worksheet #12-5
Method Blank	One per preparatory batch.	See Worksheet #12-5	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-5
LCS	One per preparatory batch.	See Worksheet #12-5	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-5
MS/MSD	One per preparatory batch.	See Worksheet #12-5	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/Accuracy	See Worksheet #12-5
Surrogate Spike	Added to all field and QC samples.	See Worksheet #12-5	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the assoicated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-5
Field duplicate	One per 10 field samples.	See Worksheet #12-5	Qualify data.	Data validator	Precision	See Worksheet #12-5

QAPP Worksheet #28-5 – Analytical Quality Control and Corrective Action (Volatile Organic Compounds in Soil)

Matrix	Soil					
Analytical Group	VOCs					
Analytical Method/SOP Reference	USEPA 624/SW8260B Per laboratory SOP L3/L4/L5/L6					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Internal Standards	Added to all field samples, standards, and QC samples.	See Worksheet #12-6	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Accuracy	See Worksheet #12-6
Method Blank	One per preparatory batch.	See Worksheet #12-6	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-6
LCS	One per preparatory batch.	See Worksheet #12-6	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-6
MS/MSD	One per preparatory batch.	See Worksheet #12-6	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/Accuracy	See Worksheet #12-6
Surrogate Spike	Added to all field and QC samples.	See Worksheet #12-6	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the assoicated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-6
Field duplicate	One per 10 field samples.	See Worksheet #12-6	Qualify data.	Data validator	Precision	See Worksheet #12-6

QAPP Worksheet #28-6 – Analytical Quality Control and Corrective Action (Semi-Volatile Organic Compounds, PAHs, 1,4-Dioxane, and Pesticides in Water)

Matrix	Water
Analytical Group	SVOCs, PAHs, 1,4-Dioxane, and Pesticides
Analytical Method/SOP Reference	USEPA 522/525.2/625/SW8270D Per laboratory SOPs L7/L8/L9/L10

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Internal Standards	Added to all field samples, standards, and QC samples.	See Worksheet #12-7	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Accuracy	See Worksheet #12-7
Method Blank	One per preparatory batch.	See Worksheet #12-7	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-7
LCS	One per preparatory batch.	See Worksheet #12-7	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-7
MS/MSD	One per preparatory batch.	See Worksheet #12-7	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/Accuracy	See Worksheet #12-7
Surrogate Spike	Added to all field and QC sample.	See Worksheet #12-7	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the assoicated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-7
Field duplicate	One per 10 field samples.	See Worksheet #12-7	Qualify data.	Data validator	Precision	See Worksheet #12-7

QAPP Worksheet #28-7 – Analytical Quality Control and Corrective Action (Semi-Volatile Organic Compounds in Soil)

Matrix	Soil					
Analytical Group	SVOCs, PAHs, 1,4-Dioxane, and Pesticides					
Analytical Method/SOP Reference	USEPA SW8270D Per laboratory SOP L4/L5					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Internal Standards	Added to all field samples, standards, and QC samples	See Worksheet #12-8	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Accuracy	See Worksheet #12-8
Method Blank	One per preparatory batch	See Worksheet #12-8	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-8
LCS	One per preparatory batch	See Worksheet #12-8	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-8
MS/MSD	One per preparatory batch	See Worksheet #12-8	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/Accuracy	See Worksheet #12-8
Surrogate Spike	Added to all field and QC samples	See Worksheet #12-8	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the assoicated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-8
Field duplicate	One per 10 field samples	See Worksheet #12-8	Qualify data.	Data validator	Precision	See Worksheet #12-8

QAPP Worksheet #28-8 – Analytical Quality Control and Corrective Action (1,4 Dioxane in Potable Water)

Matrix	Water
Analytical Group	1,4-Dioxane
Analytical Method/SOP Reference	USEPA 522 laboratory SOPs L11/L12

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Method Blank	One per preparatory batch.	See Worksheet #12-9	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-9
LCS	One per preparatory batch.	See Worksheet #12-9	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-9
MS/MSD	One per preparatory batch.	See Worksheet #12-9	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/ Accuracy	See Worksheet #12-9
Surrogate Standards	Added to all field and QC samples.	See Worksheet #12-9	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-9
Internal Standard	Added to all field and QC samples.	See Worksheet #12-9	Inspect instrument for malfunctions and correct problem. Reanalysis of samples analyzed while system was malfunctioning.	Laboratory analyst	Precision	See Worksheet #12-9
Field duplicate	One per 10 field samples.	See Worksheet #12-9	Qualify data.	Data validator	Precision	See Worksheet #12-9

QAPP Worksheet #28-9 – Analytical Quality Control and Corrective Action (Pesticides in Potable Water)

Matrix	Water
Analytical Group	Pesticides
Analytical Method/SOP Reference	USEPA 505 laboratory SOPs L11/L12

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Method Blank	One per preparatory batch	See Worksheet #12-10	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-10
LCS	One per preparatory batch	See Worksheet #12-10	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-10
MS/MSD	One per preparatory batch	See Worksheet #12-10	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/ Accuracy	See Worksheet #12-10
Surrogate Standards	Added to all field and QC samples	See Worksheet #12-10	Correct problem, then reprepare and reanalyze all failed samples for all surrogates in the assoicated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference is present, reanalysis may not be necessary.	Laboratory analyst	Accuracy	See Worksheet #12-10
Confirmation of Positive Results (second column)	All results >MDL must be confirmed	Per laboratory SOPs L11/L12	NA	Laboratory analyst	Precision	Results between primary and secondary column RPD ≤ 40%
Field Duplicate	One per 10 field samples	See Worksheet #12-10	Qualify data.	Data validator	Precision	See Worksheet #12-10

QAPP Worksheet #28-10 – Analytical Quality Control and Corrective Action (Metals in Water)

Matrix	Water					
Analytical Group	TAL Metals, Rare Earth Elements					
Analytical Method/SOP Reference	USEPA 200.8 (potable water) / SW6020A (non-potable water and soil) Per laboratory SOPs L13 through L18					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Internal Standard	Every field sample, standard, and QC sample	See Worksheet #12-11	If recoveries are acceptable for QC samples but not field samples, the field samples may suffer from a matrix effect. Reanalyze sample at 5-fold dilutions until criteria is met. For failed QC samples, correct problem and rerun all associated failed field samples.	Laboratory analyst	Accuracy	See Worksheet #12-11
Method Blank	One per preparatory batch	See Worksheet #12-11	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-11
LCS	One per preparatory batch	See Worksheet #12-11	Correct problem, then repreare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-11
MS/MSD	One per preparatory batch	See Worksheet #12-11	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/ Accuracy	See Worksheet #12-11
Laboratory Duplicate	One per preparatory batch	See Worksheet #12-11	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision	See Worksheet #12-11
Serial Dilution	One per preparatory batch if MS or MSD fails	See Worksheet #12-11	None	Laboratory analyst	Accuracy	See Worksheet #12-11
Post-Digestion Spike	One per preparatory batch if MS or MSD fails	See Worksheet #12-11	None	Laboratory analyst	Accuracy	See Worksheet #12-11
Field Duplicate	One per 10 field samples	See Worksheet #12-11	Qualify data.	Data validator	Precision	See Worksheet #12-11

QAPP Worksheet #28-11 – Analytical Quality Control and Corrective Action (Mercury in Water)

Matrix	Water					
Analytical Group	Mercury					
Analytical Method/SOP Reference	SW7470A (non-potable water) Per laboratory SOP L19					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Method Blank	One per preparatory batch	See Worksheet #12-12	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-12
LCS	One per preparatory batch	See Worksheet #12-12	Correct problem, then repreare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-12
MS/MSD	One per preparatory batch	See Worksheet #12-12	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/ Accuracy	See Worksheet #12-12
Matrix Duplicate	One per preparatory batch	See Worksheet #12-12	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision	See Worksheet #12-12
Field Duplicate	One per 10 field samples	See Worksheet #12-12	Qualify data.	Data validator	Precision	See Worksheet #12-12

QAPP Worksheet #28-12 – Analytical Quality Control and Corrective Action (General Chemistry Parameters)

Matrix	Water and Solids					
Analytical Group	General Chemistry					
Analytical Method/SOP Reference	USEPA Method 1664B and Lloyd Kahn; SW-846 methods 1010A, 6860, 7196A, 9056A, 9060A; and Standard Methods SM 2320B, 4500-NHG-G, 5210B, 5220C, 4500P-E, 4500-H-B, 2540C, 2540D, and 2540B Per laboratory SOPs L20 through L39/L41					
QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits**	**Person Responsible for Corrective Action**	**DQI**	**Measurement Performance Criteria**
Method Blank	One per preparatory batch	See Worksheet #12-13, 14	Correct problem. If required, reprepare and reanalyze method blank and all QC and field samples processed with the contaminated blank.	Laboratory analyst	Sensitivity	See Worksheet #12-13,14
LCS	One per preparatory batch	See Worksheet #12-13,14	Correct problem, then reprepare and reanalyze the LCS and all samples for failed analytes, if sufficient sample material is available.	Laboratory analyst	Accuracy	See Worksheet #12-13,14
MS/MSD	One per preparatory batch	See Worksheet #12-13,14	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision/ Accuracy	See Worksheet #12-13,14
Matrix Duplicate	One per preparatory batch	See Worksheet #12-13,14	Evaluate the source of the problem (i.e., matrix effect or analytical error).	Laboratory analyst	Precision	See Worksheet #12-13,14
Field Duplicate[1]	One per 10 field samples	See Worksheet #12-13,14	Qualify data.	Data validator	Precision	See Worksheet #12-13,14

Note:
[1] = Field duplicates do not apply to fish tissue samples.

QAPP Worksheet #28-13 – Analytical Quality Control and Corrective Action – Gamma Spectroscopy Parameters (Soil)

Matrix	Soils/Solids
Analytical Group	Gamma Spectroscopy Parameters (Ra-226 and Ra-228)
Analytical Method/SOP Reference	EPA 901.1 Modified or equivalent gamma spectroscopy procedure Per laboratory SOP L43/L44

QC Sample	Frequency/Number	Method/ SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Laboratory Duplicate	One per preparatory batch	Per laboratory SOP L-17	Correct problem, then reanalyze all samples processed with the duplicate	Laboratory analyst	Precision	RPD of ± 35% for samples with concentrations > 5-times the MDA or RPD of ± 2-times the MDA for sample with concentrations < 5-times the MDA
Method Blank	One per preparatory batch	Per laboratory SOP L-17	Correct problem, then reanalyze method blank and all samples processed with the contaminated blank	Laboratory analyst	Sensitivity	Analytes < MDA
Instrument Calibration	Annually	Per laboratory SOP L-17	Identify problem and correct prior to analyzing samples	Laboratory analyst	Precision	Must be done at least annually; see Worksheet #24 for acceptance criteria
Calibration Verification	Prior to analysis	Per laboratory SOP L-17	Correct problem, then reanalyze all affected samples	Laboratory analyst	Accuracy	Detector resolution within ±0.4 FWHM of the value determined during the initial calibration; Energy within ±1 keV of the known energies; Efficiency ±10% of effiency determined during the initial calibration
Detector Background	Monthly	Per laboratory SOP L-17	Correct problem prior ro analyzing samples	Laboratory analyst	Accuracy/ Sensitivity	Background within + 3 standard deviation of the initial background count rates

QAPP Worksheet #28-14 – Analytical Quality Control and Corrective Action (Ra-226 in Water)

Matrix	Water
Analytical Group	Ra-226
Analytical Method/SOP Reference	EPA 903.0 or equivalent Per laboratory SOP L43/L44

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Laboratory Duplicate	One per preparatory batch	Per laboratory SOP L-23	Correct problem, then reanalyze all samples processed with the duplicate	Laboratory analyst	Precision	RPD of ≤ 40% The RER should be < 1.
MS	One per preparatory batch	Per laboratory SOP L-23	Identify problem, then reanalyze MS and all associated batch samples	Laboratory analyst	Accuracy	Per laboratory control chart ± 3 sigma limit.
Preparation Blank	One per preparatory batch	Per laboratory SOP L-23	Correct problem, then reanalyze method blank and all samples processed with the contaminated blank	Laboratory analyst	Sensitivity	(Result – Error) ≤ Sample Detection Limit
LCS	One per preparatory batch	Per laboratory SOP L-23	Identify problem, then reanalyze LCS and all associated batch samples	Laboratory analyst	Accuracy	Per laboratory control chart ± 3 sigma limit.
Chemical recovery	Added to all samples, blanks, LCS, and MS	Per laboratory SOP L-23	Reprepare and reanalyze sample if recovery is low if there is activity in the sample above the QL. No reanalysis if matrix interference.	Laboratory analyst	Accuracy	25-150% Recovery
Instrument Calibration Checks	Daily	Per laboratory SOP L-23	Recount twice, if not in control place detector on hold	Laboratory analyst	Precision	Per laboratory control chart ± 3 sigma limit
Instrument Background	Daily	Per laboratory SOP L-23	Recount twice, if not in control place detector on hold	Laboratory analyst	Accuracy/ Sensitivity	Per laboratory control chart ± 3 sigma limit

QAPP Worksheet #28-15 – Analytical Quality Control and Corrective Action (Ra-228 in Water)

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Matrix	Water					
Analytical Group	Ra-228					
Analytical Method/SOP Reference	EPA 904.0 or equivalent Per laboratory SOP L43/L44					
Laboratory Duplicate	One per preparatory batch	Per laboratory SOP L-21	Correct problem, then reanalyze all samples processed with the duplicate	Laboratory analyst	Precision	RPD of ≤ 40% or ≤1 RER
MS	One per preparatory batch	Per laboratory SOP L-21	Identify problem, then reanalyze MS and all associated batch samples	Laboratory analyst	Accuracy	Per laboratory control chart ± 3 sigma limit.
Preparation Blank	One per preparatory batch	Per laboratory SOP L-21	Correct problem, then reanalyze method blank and all samples processed with the contaminated blank	Laboratory analyst	Sensitivity	(Result – Error) ≤ Sample Detection Limit
LCS	One per preparatory batch	Per laboratory SOP L-21	Identify problem, then reanalyze LCS and all associated batch samples	Laboratory analyst	Accuracy	Per laboratory control chart ± 3 sigma limit
Chemical Recovery	Added to all samples, blanks, LCS, and MS	Per laboratory SOP L-21	Reprepare and reanalyze sample if tracer is low if there is activity in the sample above the QL. No reanalysis if matrix interference.	Laboratory analyst	Accuracy	40-120% Recovery
Instrument Calibration Checks	Daily	Per laboratory SOP L-21	Recount twice, if not in control place detector on hold	Laboratory analyst	Precision	Per laboratory control chart ± 3 sigma limit

QAPP Worksheet #28-16 – Analytical Quality Control and Corrective Action (Gross Alpha/Beta in Water)

Matrix	Water
Analytical Group	Gross Alpha/Beta
Analytical Method/SOP Reference	EPA 900.0 or equivalent Per laboratory SOP L45

QC Sample	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action to be Taken if QC Sample Fails Method/SOP Acceptance Limits	Person Responsible for Corrective Action	DQI	Measurement Performance Criteria
Laboratory Duplicate	One per preparatory batch	Per laboratory SOP L-22	Correct problem, then reanalyze all samples processed with the duplicate	Laboratory analyst	Precision	RPD of ≤ 40% or ≤ 1.0 RER
MS	One per preparatory batch	Per laboratory SOP L-22	Identify problem, then reanalyze MS and all associated batch samples	Laboratory analyst	Accuracy	Recovery 70-130%
Preparation Blank	One per preparatory batch	Per laboratory SOP L-22	Correct problem, then reanalyze method blank and all samples processed with the contaminated blank	Laboratory analyst	Sensitivity	(Result – Error) ≤ Sample Detection Limit
LCS	One per preparatory batch	Per laboratory SOP L-22	Identify problem, then reanalyze LCS and all associated batch samples	Laboratory analyst	Accuracy	Recovery 80-120%
Instrument Calibration Checks	Daily	Per laboratory SOP L-22	Recount twice, if not in control place detector on hold	Laboratory analyst	Precision	Per laboratory control chart ± 3 sigma limit
Initial Calibration Blank	Daily	Per laboratory SOP L-22	Recount twice, if not in control place detector on hold	Laboratory analyst	Precision	Per laboratory control chart ± 3 sigma limit

QAPP Worksheet #29 – Project Documents and Records

Sample Collection Documents and Records	On-Site Analysis Documents and Records	Off-Site Analysis Documents and Records	Data Assessment Documents and Records	Other
Field notes (recorded electronically in field laptop) Boring logs Monitoring well construction logs Monitoring well permits Monitoring well development logs Digital photographs COC records Air bills Communications logs Copies of pertinent e-mails Field instrument records Daily health and safety briefing sheets Subcontractor sign-in sheets	Record of field instrument measurements (recorded electronically on field tablet or laptop; or hand written, scanned, and saved electronically)	Copies of all analytical data deliverables; hard copies of raw data are archived; the elecronic data deliverables (EDDs) are uploaded to the project website. The raw data files from the laboratory include analytical instrument calibration records, COC records, and sample preparation and analysis files Sample receipt records (stored on project website) Corrective action reports	Technical system field audit reports QC review of field data Data validation reports	Staff health and safety records

Data Management

This section describes the project data management process, tracing the path of the data from its generation to its final use or storage. All project data and information must be documented in a format useable to the project personnel.

Project Document Control System

Project documents will be controlled by the Arcadis PM and Technical Lead, who will maintain and distribute the hardcopies and electronic copies of the project documents, including any amendments. Electronic copies of project information will be maintained in the project directory on the Arcadis Milwaukee, Wisconsin office server and the project SharePoint Site.

Data Recording

Most of the field data collected for this project will be recorded electronically in a field application. COC records and sample labels are created by the laboratory in advance with some information pre-populated, and the remainder is filled out manually. Computer-generated data associated with laboratory analyses will be managed under the control of the assigned subcontract laboratory's laboratory information management system (LIMS). Requirements for the LIMS software can be found in the individual laboratories' QA documentation.

Data Quality Assurance Checks

Arcadis will monitor the progress of sample collection to verify that samples are collected as planned. The progress of sample collection and processing will be monitored through documentation of the samples collected each day.

The contracted laboratory will have a formal in-house QA Plan to which it adheres and performs as part of daily operations. Data generation processes will be reviewed and modified to meet objectives, if necessary. A formalized data generation procedure will be utilized. Each analyst must have previously demonstrated, through the laboratory QA program, his or her ability to generate acceptable results within the requirements of each method.

Laboratory Data Transmittal

Laboratory data are managed by the laboratory's LIMS system, beginning with sample check-in on the sample receiving data terminal. Full laboratory data reports will be delivered to Arcadis. Requested turnaround times required will be noted on the COC prior to samples being shipped to laboratory.

Data Storage and Retrieval

The analytical data generated for this site will be stored electronically (in SQL server or in an electronic data management system) on the project website. The full laboratory data reports submitted to Arcadis will be stored in the custody of the Technical Lead or designee. The laboratory will maintain copies of documents and backups of all data associated with the analyses of samples. Raw data and electronic media of all field samples, including QC samples and blanks, will be archived from the date of generation and will be kept by the laboratory. Hard copies of project files will be archived off-site at a secure facility and retained until the end of the contract; project closeout will be conducted in accordance with USEPA close-out guidelines. Data will be transferred to WDNR according to the schedule in **Worksheet #14 & #16**. Data will be transferred to Tyco upon completion of the project.

Each laboratory shall archive, electronically, the sample analyses and submit the electronic data files along with the data deliverable package. In addition, each laboratory must submit instrument manufacturer, method files, and ID file information. Arcadis must receive this information in the event a laboratory on this project closes or updates hardware/software.

QAPP Worksheet #31, 32 & 33 – Assessments and Corrective Actions

ASSESSMENTS					
Assessment Type	**Responsible Party and Organization**	**Number/Frequency**	**Estimated Dates**	**Assessment Deliverable**	**Deliverable Due Date**
QC Reports of any non-conformance	Field Team Members, Arcadis	Daily as required	During field activities	Contained within daily QC report	No later than one week after field activities are completed
Field Safety Task Improvement Process	HSO, Arcadis	One for every 40 hours at the site, one for every new type of field work	During field activities	Electronic submittal of form; if a safety violation is noted, a follow-up discussion is completed	No later than one week after field safety Task Improvement Process is completed; take immediate corrective action if necessary
Internal Laboratory Audit	Laboratory Management, Eurofins	Annually per State and Federal lab certification requirements	Per Laboratory Quality Manual	Per Laboratory Quality Manual	Per Laboratory Quality Manual
Laboratory report deliverables and analytical results review against QAPP requirements	Data Validator, Arcadis	Per sample delivery group	Immediately following field sampling	Communication in the form of an email; Data Validation Report	Two months after receipt of data

ASSESSMENT RESPONSE AND CORRECTIVE ACTION					
Assessment Type	**Responsibility for Responding to Assessment Findings**	**Assessment Response Documentation**	**Timeframe for Response**	**Responsibility for Implementing Corrective Action**	**Responsibility for Monitoring Corrective Action Implementation**
Non-Conformance	PM, Arcadis	Non-conformance form	Within 24 hours	PM or designee, Arcadis	PM, Arcadis
Field Safety TIP	Technical Lead or designee, Arcadis	Incident Form	Within 24 hours	PM or designee, Arcadis	HSO, Arcadis
Internal Laboratory Audit	Laboratory QA Officer, Eurofins	Per Laboratory Quality Manual	Per Laboratory Quality Manual	Laboratory Personnel, Eurofins	Laboratory QA Officer, Eurofins
Laboratory report deliverables and analytical results review against QAPP requirements	Laboratory QA Officer, Eurofins	If required, laboratory reports will be amended, and corrections noted in the case narrative	Within 72 hours of notification	Laboratory QA Officer, Eurofins	Data Validator, Arcadis

Non-Conformance/QC Reporting

A non-conformance is defined as an identified or suspected deficiency or discrepancy with regard to an approved document (e.g., improper sampling procedures, improper instrument calibration, calculation, computer program); or an item where the quality of the end product itself or subsequent activities using the document or item would be affected by the deficiency; or an activity that is not conducted in accordance with the established plans or procedures.

Any staff member engaged in project work that discovers or suspects a non-conformance is responsible for initiating a non-conformance report to the Technical Lead Site Investigations and/or Technical Lead Data Evaluation. The Technical Lead Site Investigations and/or Technical Lead Data Evaluation will evaluate each non-conformance report will provide a disposition which describes the actions to be taken. An example Non-Conformance/QC report form is included in **Appendix C**.

The PM will verify that no further project work dependent on the nonconforming item or activity is performed until approval is obtained and the non-conformance is properly addressed. If the non-conformance is related to material, the Technical Lead shall be responsible for marking or identifying, with the non-conformance report number, the nonconforming item (if practical) and indicating that it is nonconforming and is not to be used. A copy of each non-conformance report will be included in the project file. Copies of all non-conformances shall be maintained by the QA Manager.

Assessment and Oversight

This element addresses assessment of the effectiveness of the project implementation and associated QA/QC activities.

Assessment and Response Actions

To monitor the capability and performance of the field activities, several types of audits will be performed. These audits will be conducted by the PM or designee. Performance audits of laboratories are conducted to measure the accuracy of the measurement systems. Data Quality Audits are conducted to determine whether the data generated by the sampling and analysis satisfy the DQOs.

Field Corrective Actions

At the end of each sampling day, the sampling team is to report any problems requiring corrective action that were encountered during the day to the Task Manager. Corrective action will be undertaken when a non-conforming condition is identified. A non-conforming condition occurs when QA objectives for precision, accuracy, completeness, representativeness, or comparability are not met, or when procedural practices or other conditions are not acceptable. A report is to be filed that documents the problems encountered and the corrective action implemented. A Stop-Work Order may be issued by the Arcadis PM, following notification to the Project Lead, if corrective action does not adequately address a problem, or if no resolution can be reached.

Internal Laboratory Audits

As part of its QA program, the Laboratory QA Manager will conduct periodic checks and audits of the analytical systems to ensure that the systems are working properly, and personnel are adhering to established procedures and documenting the required information. These checks and audits will also assist in determining or detecting where problems are occurring.

In addition to conducting internal reviews and audits, as part of its established QA program the laboratory is required to take part in regularly scheduled Performance Evaluations and laboratory audits from state and federal agencies for applicable tests. Each laboratory selected to support this program must maintain current WDNR or federal certifications, as appropriate.

Laboratory Corrective Actions

If a laboratory analysis is deemed “out of control,” corrective action will be taken by the laboratory to maintain continued data quality. Each laboratory must adhere to their in-house corrective action policy. The coordinator of the laboratory’s analytical section will be responsible for initiating laboratory corrective action when necessary.

Data Quality Audits

Data Quality Audits are conducted to determine whether the data are adequate to support the DQOs and to determine the cause of deficiencies if the data quality is not adequate. This audit is conducted by the QA Manager or designee after the data have been fully validated. The QA Manager or Data Validator will first determine to what extent the data can be used to support the decision-making process. If the data are deficient, the QA Manager or Data Validator will identify the cause of the deficiency and will determine what modifications need to be made (e.g., request that the laboratory analyze a larger volume sample or employ an alternate or modified method to lower the RLs) so that subsequent data are acceptable.

QAPP Worksheet #34 – Data Verification and Validation Inputs

Item	Description	Verification (completeness)	Validation (conformance to specifications)
Planning Documents/Records			
1	Approved QAPP	X	
2	DMP	X	
3	Contract	X	
4	Field SOPs	X	
5	Laboratory SOPs	X	
Field Records			
6	Field logbooks	X	
7	Equipment calibration records	X	
8	COC forms	X	
9	Sampling diagrams/surveys	X	
10	Drilling logs	X	
11	Relevant correspondence	X	
12	Change orders/deviations	X	
13	Field audit reports	X	
14	Field corrective action reports	X	
Analytical Data Package			
15	Cover sheet/Laboratory identifying information	X	
16	Case narrative	X	
17	Internal laboratory COC	X	
18	Sample receipt records	X	
19	Sample chronology (i.e., dates and times of receipt, preparation, and analysis)	X	X
20	Communication records	X	
21	MDL/RL establishment and verification	X	X
22	Standards traceability	X	
23	Instrument calibration records	X	X
24	Definition of laboratory qualifiers	X	
25	Results reporting forms	X	X
26	QC sample results	X	X

Item	Description	Verification (completeness)	Validation (conformance to specifications)
27	Correction action reports	X	
28	Raw data	X	X
29	Electronic data deliverable	X	

QAPP Worksheet #35 – Data Verification Procedures

Records Reviewed	Required Documents	Process Description	Responsible Person, Organization
Field logbook	QAPP	Verify that records are present and complete for each day of field activities. Verify that all planned samples, including field QC samples, were collected and that sample collection locations are documented. Verify that meteorological data were provided for each day of field activities. Verify that changes/exceptions are documented and were reported in accordance with requirements. Verify that any required field monitoring was performed, and results are documented.	Daily – Field Team Leader, Arcadis At conclusion of field activities – QA Manager or designee, Arcadis
COC forms	QAPP	All samples to be analyzed by the laboratory will be shipped via overnight delivery or will be sent via the laboratory courier service. Upon receipt, a laboratory representative will check the integrity of the custody seals and will sign and date the COC to acknowledge sample receipt. The laboratory is responsible for verifying that the COC and containers agree and that the sample containers are received in good condition. The sample receipt form will be sent to Arcadis prior to preparation for analysis. The LIMS will provide evidence of sample custody from receipt by the laboratory until appropriate disposal.	Daily – Field Team Leader, Arcadis Upon receipt – Sample Custodian, Eurofins At conclusion of field activities – Data Validator, Arcadis
Laboratory corrective action report	QAPP	Routine corrective actions apply to all analytical quality control parameters and analytical system specification as defined in the laboratory SOPs. Bench analysts have full responsibility and authority for performing routine corrective action, which are documented as part of the analytical record. Defective processes, holding time violations, systematic errors and quality defects that occur are to be reported by the bench chemist to the laboratory supervisor and a non-conformance record initiated. The Laboratory PM will then notify the Arcadis PM. All notifications must be made in a timely manner. The non-conformance record should become part of the analytical record.	Before release – PM, Eurofins Upon receipt – PM, Arcadis
Analytical data package – laboratory	QAPP	All data produced by the laboratory will be required to undergo several levels of review, which will include two levels of management review at the laboratory. The laboratory will review the data packages internally for completeness and verify that the required forms and raw data are included for each data package type. The laboratory QA Officer may also select to review randomly chosen data packages for additional audits.	Before release – PM, Eurofins Upon receipt – Data Validator, Arcadis

Records Reviewed	Required Documents	Process Description	Responsible Person, Organization
Analytical Data Package/Laboratory Quality Control	QAPP	The Data Validator or designee will verify that data have been received for all samples sent to the laboratory. An evaluation of this data will be performed to determine whether the laboratory met the QC requirements for the analytical as stated in the analytical methods and laboratory SOPs. Refer to **Worksheets #19 & 30 and 28**.	Data Validator, Arcadis
Analytical Data Package/Laboratory Quality Control	QAPP	An evaluation of the data will be performed to determine whether the laboratory met the QC requirements for the analytical results as stated in the analytical methods, laboratory SOPs, QAPP, and applicable data validation guidance.	Data Validator, Arcadis
Laboratory EDD	QAPP	The Arcadis Database Manager will review these files for correctness and completeness.	Database Manager, Arcadis

QAPP Worksheet #36 – Data Validation Procedures

Data Validator: Arcadis

Sample Type/Location	Residential Well Monitoring (POET/Private Well)
Analytical group/method:	Chemistry Parameters: PFAS, Metals
Data deliverable requirements:	Level IV (PDF)[1], EQUIS 4-file format (EDD)
Analytical specifications:	Worksheets #28-1 through #28-10 Laboratory SOPs L2, L15, L16, L46
Measurement performance criteria:	Worksheets #12-2 and #12-10
Percent of Stage 2a validation to be performed:	100%
Percent of Stage 4 data validation to be performed:	100%
Sample Type/Location	**Groundwater and Surface Water (Ditch Monitoring, Stanton Street Investigation)**
Analytical group/method:	Chemistry Parameters: PFAS, VOCs, PAHs, SVOCs, General Chemistry
Data deliverable requirements:	Level IV (PDF)[1], EQUIS 4-file format (EDD)
Analytical specifications:	Worksheets #28-2, #28-6, #28-11 Laboratory SOPs L2, L4, L9, L28, L38, L46
Measurement performance criteria:	Worksheets #12-2, #12-4, #12-6, #12-12
Percent of Stage 2a validation to be performed:	100%
Percent of Stage 4 data validation to be performed:	None
Sample Type/Location	**Biosolids Private Well Sampling**
Analytical group/method:	Chemistry Parameters: PFAS, 1,4-Dioxane, Pesticides, Metals
Data deliverable requirements:	Level IV (PDF)[1], EQUIS 4-file format (EDD)
Analytical specifications:	Worksheets #28-2, #28-6, #28-8, #28-9 Laboratory SOPs L2, L10, L11, L12, L13, L14, L46
Measurement performance criteria:	Worksheets #12-2, #12-7, #12-8, #12-10
Percent of Stage 2a validation to be performed:	100%
Percent of Stage 4 data validation to be performed:	100%
Sample Type/Location	**Soil**

Analytical group/method:	Chemistry Parameters: PFAS, VOCs, General Chemistry
Data deliverable requirements:	Level IV (PDF)[1], EQUIS 4-file format (EDD)
Analytical specifications:	Worksheets #28-3, #28-5, #28-11 Laboratory SOPs L2, L4, L5, L9, L17, L18, L19, L36, L39, L46
Measurement performance criteria:	Worksheets #12-3, #12-5, #12-13
Percent of Stage 2a validation to be performed:	100%
Percent of Stage 4 data validation to be performed:	TBD
Sample Type/Location	**Fish Tissue**
Analytical group/method:	Chemistry Parameters: PFAS
Data deliverable requirements:	Level IV (PDF)[1], EQUIS 4-file format (EDD)
Analytical specifications:	Worksheets #28-3 Laboratory SOPs L2, L42, L46
Measurement performance criteria:	Worksheets #12-3
Percent of Stage 2a validation to be performed:	100%
Percent of Stage 4 data validation to be performed:	TBD
Sample Type/Location	**Waste Characterization**
Analytical group/method:	Chemistry Parameters: PFAS, SPLP PFAS, VOCs, SVOCs, Metals, General Chemistry
Data deliverable requirements:	Level IV (PDF)[1], EQUIS 4-file format (EDD)
Analytical specifications:	Worksheets #28-2, #28-4, #28-6, #28-9, #28-10, #28-11 Laboratory SOPs L2, L4, L9, L28, L38, L46
Measurement performance criteria:	Worksheets #12-2, #12-4, #12-6, #12-10. #12-11, #12-13
Percent of Stage 2a validation to be performed:	None
Percent of Stage 4 data validation to be performed:	None

Commercial Subcontractor Laboratory Data

The typical data validation process tiers are defined as follows:

- **Stage 1 (data verification):** Data verification is the process by which laboratory results are checked to provide that the proper quality control steps were performed and key items have met QC objectives (both analytical and contractual). The key items checked in data verification include:
    - Procedures used for sample collection, handling, and analysis

- Documentation of field sampling, handling, and analysis activities (e.g., QC signatures in field logs, QC checklist)
- Internal verification at the data generator level of sampling, handling, on-site analytical and off-site laboratory data
- Laboratory data (e.g., laboratory-qualified data)
- Sampling, on-site analytical and off-site laboratory data
- Completeness of data package deliverable
- Case narrative
- All analytical results
- QC sample data summaries
- Applicable raw data.

- **Stage 2a (limited verification/validation):** In addition to the elements of a Stage 1 review, Stage 2 includes a review of DQIs, which are generally defined in terms of the following six parameters:
  - Representativeness
  - Comparability
  - Completeness
  - Precision
  - Accuracy
  - Sensitivity.

  The Stage 2 process includes review of holding times, blanks, matrix spikes, laboratory control samples, and surrogate recoveries. The results of the review of the DQIs are assessed, and appropriate data qualifiers are applied to the dataset as appropriate. The Stage 2 validation is “limited” in that no raw data are evaluated, and only the forms that list the DQIs are reviewed.

- **Stage 4 (verification/validation):** In addition to the Stage 1 and Stage 2 elements, Stage 4 includes a detailed review of laboratory calibrations and raw data to check for errors in calculation, compound identification, and transcription, as presented in the previous section (Current Validation Process). As defined above, all data provided by the laboratory will be validated for all QA/QC parameters including accuracy, precision, completeness, and comparability in accordance with USEPA guidance. The oversight of laboratory QA/QC will be as proactive as possible to ensure valid data are produced during the sampling round. Evaluation of the analysis methodology, method compliance, and any corrective actions should also be performed. This task also includes additional research on analyte detection history, analytical interferences related to potential false positive and false negative results.

Once data validation is completed, a data validation report will be generated. The report will contain information regarding the parameters that are qualified, the reason for the qualification, and the direction of the bias (only for parameters qualified as estimated), when possible. Based upon the QA review of the analytical data, specific codes (data qualifiers or ‘flags’) will be placed next to results to provide an indication of the quantitative and qualitative reliability of the results. The data qualifier codes in the National Function Guidelines will be used for this project. Qualifiers assigned by laboratories will be defined by each laboratory in their data package and will be superseded by the data validator’s qualifiers.

The following validation protocols were used as guidance for the chemical data:

- Department of Defense (DoD) Quality Systems Manual (QSM) 5.4, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 6: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-24, November 2022.
- Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-15,
- Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations (EA-19-0001), December 2019.
- Department of Defense Department of Energy Consolidated Quality Systems Manual for Environmental Laboratories, Version 6.0, December 2023
- USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using USEPA Method 537 (EPA 910-R-18-001), November 2018.
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (EPA-540-R-20-005), November 2020.
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540/R-99/008), October 1999.
- USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA-540-R-20-006), November 2020.
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 540-R-04-004), October 2004.
- USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA 540-R-08-005), January 2009.

Additional resources utilized for the data validation are include in **Appendix B**.

Field Data Evaluation

Procedures to evaluate field data for this program include reviewing the data entered in the field application books to ensure that errors have not been made. The field data documentation should include data generated during measurement of field parameters, observations, results of any QC sample analyses, and field instrument calibrations. This task will be the responsibility of an Arcadis Data Reviewer with oversight by the QA Manager or designee.

QAPP Worksheet #37 – Data Usability Assessment

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used

Data validation will be conducted by Arcadis in accordance with the protocols outlined in **Worksheet #36**. Field measurements will be verified in accordance with the protocols outlined in **Worksheet #36**.

Following data validation and verification, Arcadis will conduct a Data Usability Assessment to determine the adequacy of the data to support project decision making. The usability step will involve assessing whether the process execution and resulting data meet the project quality. The Data Usability Assessment will assess the following:

- Precision: Results of field duplicates and laboratory duplicates, LCS/LCSD, and/or MS/MSD (depending on analytical method) will be evaluated based on the measurement performance criteria presented in **Worksheet #12**. Any conclusions about the precision of the analyses or sample collection techniques will be drawn and any limitations on the use of the data will be described. Precision for chemical parameters will be evaluated by RPD.
- Accuracy/Bias Contamination: Results of rinse blanks, trip blanks, and laboratory blanks will be evaluated based on the measurement performance criteria presented in **Worksheet #12**. Any conclusions about the accuracy/bias of the analyses based on contamination will be drawn and any limitations on the use of the data will be described.
- Overall Accuracy/Bias: Results of LCS, surrogate compounds, and MS samples will be evaluated based on the measurement performance criteria presented in **Worksheet #12**. Any conclusions about the overall accuracy/bias of the analyses will be drawn and any limitations on the use of the data will be described.
- Sensitivity: All analytical results reported will be evaluated to determine whether adequate sensitivity was achieved. The results for each analyte will be cross-checked against the quantitation limits presented in **Worksheet #15**. Results for analytes that do not meet project quantitation limit criteria will be summarized. Any conclusions about the sensitivity of the analyses will be drawn and any limitations on the use of the data will be described.
- Representativeness: Representativeness is achieved through adherence to sampling and analytical procedures described in this QAPP and compliance with stipulated sample holding times. After evaluation of relative compliance with specified procedures and holding times, field duplicate results will be reviewed; (for example, RPD will be calculated and reviewed per the performance criteria listed in **Worksheet #12**). Conclusions about data representativeness will be drawn and any limitations on the use of data will be described.
- Comparability: Data comparability will be assessed through evaluation of sample-specific reporting limits, units of measure, and adherence to specified analytical methodologies and field/sample collection SOPs specified in the QAPP. After the evaluations are completed, conclusions about data comparability will be drawn and any limitations on the use of data will be described.
- Completeness: The field completeness will be calculated by the ratio of the number of reportable samples (non-rejected sample results after the laboratory, QC performance criteria, and validator evaluation) received in acceptable condition by the laboratories to the number of samples planned to be collected as specified in this document.

Describe the evaluative procedures used to assess overall measurement error associated with the project:

As part of the data validation process, the validator will identify any qualifications on the data, identify the bias (if known) of the data, and apply qualifiers and comments on the usability of the data. Once the validation package is received from the validator, it will be reviewed by the QA Manager or designee. Any QA/QC problems with the validation will be discussed with the validator and laboratories.

Identify the personnel responsible for performing the usability assessment:
The usability assessment of the data is the responsibility of the PM, Technical Lead, and QA Manager. The data users will also participate in a usability assessment to determine whether the data are sufficient to meet project data needs and DQOs and will make recommendations if additional data are required.

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Figures

Appendices

Appendix A

Field Activity Standard Operating Procedures

QP 3.06 – Field Activities Documentation

Rev: 2

Rev Date: July 19, 2023

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	November 8, 2016	All	QP Issued	QMS
	1	November 30, 2021	All	Updated Template for QMS Relaunch October 12, 2021	Matt Spurlin Brian Webb David Gerber
	2	July 19, 2023	All	Annual review completed by SME. Rev number and date updated.	Brian Webb
			Page 6	Deleted “Collector, Survey123” replaced with "ESRI Field Maps, ESRI Survey123"	

Approval Signatures

Prepared by:	Matt Spurlin / Brian Webb	7/19/2023
	Names (Preparers)	Date
Quality Reviewer:		7/19/2023
	Matt Spurlin / Brian Webb (Quality Reviewers)	Date
QMS Approver:		7/19/2023
	David Gerber (QMS Approver)	Date

STATEMENT OF POLICY:

It is Arcadis Environment Business Line (ENV) policy that field activities must be documented to facilitate the interpretation of data; show compliance with project plans, work plans, and contract terms; and to serve as evidentiary records. Documentation reflecting activities performed must be legible, organized, and complete. Applicable regulatory and client requirements should be considered when documenting field activities. Project-specific requirements for documentation typically should be described in the Work Plan, Field Sampling Plan (FSP), and/or in the Quality Assurance Project Plan (QAPP).

1 Purpose

The purpose of this Quality Procedure (QP) is to provide a standard procedure for the documentation of fieldwork activities. This documentation pertains to site-related projects, but is not limited to the collection of samples, subsurface information, and oversight of construction activities. Field documentation must include, at a minimum, project title and number, date and times of activities, the identification of the employee performing the work, and the specifics of the work being performed.

2 Responsibilities

Certified Project Manager (CPM) – is responsible for the project-related administration of this QP.

Quality Consultant – is responsible for providing quality assurance and quality control guidance to the CPM in implementing this procedure. Note that for federal projects, there are specific requirements and qualifications for the QA Officer assigned to the project.

Project Team Members – who are assigned to document field activities, are responsible for compliance with this procedure.

Quality Reviewer – The Quality Reviewer is responsible for final review of this Quality Procedure (QP). Quality Reviewers may be a Quality Consultant, QMS Document Owner, Technical Solution Leader, Community of Practice Leader, or another qualified subject matter expert (SME).

3 Terms and Conditions

Field Sampling Plan (FSP) – A document that describes the procedures and protocols necessary to complete field sampling and data collection activities.

Work Plan – A document that describes proposed project activities.

Quality Assurance Project Plan (QAPP) – A document that prescribes the quality assurance/quality control (QA/QC) procedures to be followed. Uniform Federal Policy (UFP) QAPPs are now frequently required for environmental projects by most federal regulatory agencies. A UFP QAPP includes Worksheets used to document the entire project plan developed following the systematic planning process. For more details on the UFP QAPP see http://www.epa.gov/fedfac/documents/qualityassurance.htm. Note that if the project QAPP is written following the UFP format, it will also contain a description of the sampling rationale and sampling locations as well as QA/QC requirements. The UFP QAPP format is designed to capture the entire systematic planning process. If a UFP QAPP is written for a project, a separate FSP is generally not required unless specified by the particular client or contract.

Technical Guidance Instruction (TGI) – Document describes the procedure and/or protocol necessary to conduct a specific activity.

4 Related Documents

Forms used for documenting field activities may be included as attachments to the FSP or the QAPP and may include the following examples:

- Chain-of-custody (COC) form;
- Sample data log;
- Field modification form;
- Sample receipt form;
- Corrective action form;
- Field activity log;
- Calibration log;
- Analysis request and chain-of-custody record;
- Daily quality control reports;
- Purge log;
- Soil boring log.

Examples of TGIs with forms and check-lists can be found in the QMS Document Library.

5 Description of the Procedure

1. General Requirements

1.1 Documentation Format

Documentation of field activities provides an accurate and comprehensive record of the work performed sufficient for a technical peer to reconstruct the day's activities and confirm that necessary client, regulatory, contract, and work plan requirements were met. General requirements include:

- Use of field books (preferably bound) as the primary source for information collection and recording. Field books should be dedicated to the project and appropriately labeled.
- Use of a Field Activity Log is suggested to formally document activities and events as a supplement to bound field books. The Field Activity Log can be a standard or project-specific form or a bound field book. Preprinted standard forms are available for many activities and should be used whenever possible. These forms will provide prompts and request additional information that may be useful and/or needed. Project-specific field forms may be generated, or existing forms may be modified to meet specific project needs. Client-supplied forms may be substituted, as required.
- Appropriate header information is documented on the first page of notes for each day of fieldwork, including project title, project number, date, time, author, and relevant setting information such as weather conditions, topography, surface water conditions, observed site activities/uses, and other persons in field team. In addition, include on every page of notes the page number and date. Project-specific information depends on

the nature of work being performed and should be discussed by the project team prior to commencing fieldwork. As appropriate, dedicated field logs/journals or forms should be used. When Field Activity Log Forms are used, information fields that are not applicable should be noted as such with the symbol "N/A" or other appropriate notation.

- Field documentation entries shall be made using indelible ink.
- Data entries shall be legible. A single line should be drawn through incorrect entries and the corrected entry written next to the original strikeout. Strikeouts are to be initialed and dated by the originator.
- Units of measurement shall be specified. The level of accuracy shall be indicated (e.g., observed estimate vs. quantified census from direct count).
- Field records are to be maintained in project files unless otherwise specified by a client or stipulated by a contract.
- Unless addressed specifically by a client or stipulated by a contract, site photographs should be taken to document the general setting and landscape as well as site-specific issues/resources of interest. Photo locations and the compass direction of view should be recorded in the notes with the photo number.
- Alternatively, use of field tablets with data plans and electronic data collection software supported by Cloud services (e.g., Fulcrum, ESRI Field Maps, ESRI Survey123) that are pre-loaded with appropriate data collection forms (e.g., method-specific sampling, soil logging, photo logs, H&S tailgate meetings, well/piezometer/lysimeter installations, electronic chain of custody, etc.). All forms adhere to the relevant documentation format requirements (described above and below this section) for data collection with conventional paper methods. Electronic data collection services, as well as training, are available to Arcadis field staff through the FieldNow® program and while optional are highly encouraged.

1.2 Documentation Entries

A chronology of field events should be recorded. General entry requirements include:

- Visitors to the site, including owner and regulatory agency representatives
- Summary of pertinent project communications with the client, regulators, or other site visitors during the fieldwork
- Other contractors or entities working on site
- A description of the day's field activities, generally in chronological sequence or in order of significance, using military time notation (e.g., 9:00 a.m. as 0900, and 5:00 p.m. as 1700)
- If applicable, calibration of measuring and test equipment and identification of the calibration standard(s) (use a Calibration Log, if available, with cross-reference entered into the field book)
- Field equipment identification, including information such as the type, manufacturer, model number, or other specific information
- If applicable sampling activities are being performed, weather information such as temperature, wind speed and direction, precipitation, time of measurement, and units
- Documentation of safety meeting (e.g., tailgates and tailboards) topics and attendees
- Verification of subsurface utility clearance in accordance with ENV policy
- Safety and/or monitoring equipment readings, including time of measurements and units
- If applicable, specific forms used for collection of data are referenced in the field notebook
- Subcontractor progress and/or problems encountered
- Changes in the scope of work
- Other unusual events.

2. Specific Requirements

2.1 Sample Collection

Sample collection data are documented in a bound field book, electronic field forms provided by the FieldNow® program, and/or on a Field Activity Log. Where both are being used, information contained in one is cross-referenced to the other. Entries such as the following examples should be consistent with the requirements in the project-specific Work Plan, FSP, and QAPP:

- Sample identification number, location taken, depth interval, sample media, sample preservative, collection time, and date
- Sample collection method and protocol
- Physical description of the sample (using a standard classification system for soil)
- If a composite sample, include the number, location(s), and depth(s) of grab samples incorporated in the composite
- Quality-related samples (e.g., field duplicates, trip blanks, equipment rinse, blanks matrix spikes, and matrix spike duplicates)
- Container description and sample volume
- Pertinent technical data, such as pH, conductivity, temperature, and head-space readings
- Pertinent technical comments
- Identification of personnel collecting the sample.

2.2 Sample Labeling

Sample labels must be prepared and attached to sample containers. Labels are either provided by the laboratory performing the analyses or are generated internally. Labels should be indelible and securely attached to the container. The information to be provided may include:

- Sample identification number
- Sample date, initials, or name of who collected the sample, and collection time
- Physical description of the sample (e.g., water, solid, gas, or other physical medium)
- Analytical parameters and method(s)
- Preservatives, if present
- Sample location and depth, if applicable
- Client.

Although this information is typically written out, it can also be recorded in an electronic tracking system if a bar code is used.

2.3 Analysis Request and Chain-of-Custody Record

A critical component of data collection is the documentation that the samples were obtained from specific locations and received by the laboratory or archive without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal or archive must be properly documented. Documentation will be accomplished through a COC record that documents each sample and identifies the individuals responsible for sample collection, shipment, and receipt. A sample is considered in custody if at least one of the following criteria is met:

- The sample is in a person's actual possession
- The sample is in unobstructed view, after being in the person’s actual possession
- The sample is locked and only accessible by the custodian after having been in the person’s actual possession
- The sample is in a secured area, restricted to authorized personnel (e.g., laboratory).

An example COC form to be used by ENV personnel in collecting and shipping samples can be found on the corporate Intranet. A laboratory typically will not accept samples for analysis without a correctly prepared COC form. The COC must be signed by each individual who has the sample in his/her custody. Each sample shipped to a laboratory for analyses must be documented on the COC. Information on this form correlates with other supporting documentation, including the field logbook, sample labels, and sample collection logs.

The COC documents the elapsed time and the custodians of the sample from the time of its collection. The individuals who have physically handled the sample(s) or witnessed initial sample collection and packaging (sample team member) must be identified on the form. A sample team member relinquishes the sample by signing the COC. Individuals who either relinquish or receive samples must include their complete names, company affiliation, and the date and time the sample(s) were relinquished. The times that the samples are relinquished and received by the next custodian should coincide, with the exception of transfer by commercial carriers. These carriers will not be required to sign the COC.

If a sample is to be stored for a period of time (e.g., overnight), measures are taken to secure the sample container in a manner that only provides access to the custodian of record. If samples are relinquished to a commercial carrier (i.e., UPS or Federal Express), the carrier waybill number is recorded, and a copy of the waybill is attached to the COC. These documents are maintained with other field documentation. The original COC is sealed inside a zip-top plastic bag and placed inside the shipping container with the samples.

If corrections are made to the COC, the corrections should be made (single line through the error, initial, and date) by the originator of the change, and, if necessary, an explanation of the change should be provided. The documentation should be of a level of detail that clearly documents the change to a third-party reviewer.

Guidance for choosing a laboratory and completing analyses requests and COC can be found in QP 2.09-Subcontracting Laboratory Services and on the corporate Intranet for the Arcadis Laboratory Program (ALP) and should also be described in the project-specific planning documents (i.e., Work Plan, FSP. or QAPP).

The option to use the Electronic Chain of Custody (eCOC) form in conjunction with the appropriate sample application(s) may be available through the FieldNow® program but is currently limited to a select list of approved analytical laboratories. Use of the eCOC application is intended to reduce common transcription errors both by field staff and laboratory staff on a conventional handwritten paper COC. Once the eCOC form is completed and approved on the field tablet by field staff, a PDF version of the form is automatically emailed to each assigned team member. In addition, a dedicated or mobile printer is recommended for printing a hard copy of the completed eCOC to be included in each sample cooler to meet laboratory requirements.

2.4 Subsurface Logs

Test pits, soil borings, monitoring wells or rock coreholes wells, and piezometer installations are to be recorded in bound field books or electronic soil logging field form provided by the FieldNow® program and may be supplemented with prepared forms. Personnel completing the log are to supply the following information:

- Administrative and technical information included in the header.
- Types of equipment used (e.g., drill rig type, drilling tools used [including diameter and length], or backhoe model).
- Subcontractor/driller used.
- Descriptions of subsurface materials encountered, and the number and type of samples collected, if any.
- Subsurface exploration depth and units of measure.
- For drilling, length of recovery.
- Sample type and sample number for geotechnical or analytical samples collected. These data are to be also entered on the sample collection log (if used) and the sample label.
- Classification standard protocol used, if any (e.g., ASTM International Standard Penetration Test).
- Narrative description of the soil, sediment, or bedrock (using standard classification system) and other pertinent information.
- Additional data, such as background and sample vapor/gas readings, observation of sheens, non-aqueous-phase liquid, depth to water (if encountered), presence of (but generally not description of) odors, changes in drilling conditions, and other pertinent information.
- Description of the materials used to seal the boring unless it is completed as a well or piezometer.

When using the electronic soil logging field form, draft logs can be exported to appropriate formats through Arcadis's internal reporting services for QC. Revisions can be made to the soil logging forms using the field tablets, then re-synced to the server and re-exported to PDF as final draft.

2.5 Monitoring Well/Piezometer Installation

In addition to requirements in Section 2.4, subsequent well or piezometer development activities may involve transcription of field data from the field book onto a computer-based boring log. The field notebook or electronic soil logging/well construction field form provided by the FieldNow® program is to be used to identify the chronology and major events of the installation activity, and the computer-based boring log is to be used to correlate the geologic strata to the major elements of the monitoring well construction. Information to be collected and recorded must meet the regulatory and client requirements and may include the following:

- Location identity
- Screen and riser type, length, diameter, and location
- Diameter
- Total depth
- Sump location and depth and diameter
- Materials of construction (e.g., stainless steel, polyvinyl chloride, or other material)
- Seal type(s) and or depth(s)
- Sand or gravel pack type, including materials (e.g., silica) and gradation
- Depth to water before and after installation.

When using the electronic soil logging/well construction field form, draft logs can be exported to appropriate formats through Arcadis's internal reporting services for QC. Revisions can be made to the soil logging/well construction forms using the field tablets, then re-synced to the server and re-exported to PDF as final draft.

2.6 Air Sampling Logs

At a minimum, air sampling documentation should include:

- Start and finish time of sampling
- Sampling location
- Sampling method/media
- Volume sampled.

2.7 Construction, Demolition, Abandonment, and Related Activities

Monitoring and documentation of construction and comparable activities shall be documented in bound field books and/or on appropriate company forms and should include similar information as specified above, including information such as:

- Project name and number
- Owner or client name
- Contractor or subcontractors performing the work
- Contractor or subcontractor superintendent(s) and personnel (as available) on site
- Chronological sequence and description of work activities performed, including workday start and completion times
- Reference to contract sections, work plans, or specifications describing work being performed
- Reference to relevant permit conditions and regulatory requirements and/or reference to regulatory guidance documents controlling work approach
- Listing of all trades performing work by contractor and subcontractor
- Hours worked per trade
- Work hours per day per shift, if applicable
- Equipment on site (e.g., description, model number, size, and type) and hours of use
- Listing of equipment on site being left idle
- Description and quantity of materials used or incorporated, with reference to contract or specification item number, if feasible; include simple sketch of excavation with approximate dimension, if applicable
- Calculations with dimensions for quantities of material used or incorporated
- Delineation of the work area and access routes (e.g., fencing, flagging, or staking), confirmation that activities occurred within the work area or description of work occurring outside the delineated work area and justification (as needed), and characterization of impacts outside the designated work area
- Documentation of compliance with speed limits, dust control, erosion control best management practices, and other basic elements of construction activities as dictated by project work plans and applicable permits and regulatory criteria.

2.8 Daily Safety Meeting

A Daily Safety Meeting is to be conducted and documented each workday prior to the initiation of field activities, with on-site ENV personnel, contractors, subcontractors, and visitors if possible. Safety topics discussed are entered on the Daily Safety Meeting Form (available on the corporate Intranet). Topics discussed should include site-specific conditions, procedures to be followed that day, and protective equipment. A printed listing of the attendees at the meeting and their signatures should be included. Other required data are:

- Identification of the individual conducting the meeting and his/her signature
- Identification of the project supervisor and project manager.

The option to use the electronic H&S tailgate meeting field form is available through the FieldNow® program. The completed form can be exported to appropriate formats through Arcadis's internal reporting services for documentation purposes.

2.9 Calibration

Documentation of the calibration and calibration results shall be made for field equipment requiring calibration measuring and test equipment calibration data are recorded in the field book or on the Field Activity Log. Calibration data include the following:

- Unique identification of instrument being calibrated, including type, model, and serial number
- Date and time of calibration
- Standards used in the calibration, including standard identity, concentration, lot number, and manufacturer of the standard
- Instrument reading with respect to each calibration standard
- Comments, as necessary, regarding instrument performance.

2.10 Photographs and Videos

When the client allows, photographs and videos may be used to help document pre-, active, and post-field activities. In sensitive areas (e.g., secured, or confidential), the client must be contacted to evaluate security procedures concerning use of photographs or videos. Photographic and video documentation should include project title, project number, date, time, and description of conditions. The time should also be documented if time is important to a sequence of photographs.

Photographs are documented by numbering digital photographs and identifying the number and subject on the Field Activity Log or the electronic photograph log through the FieldNow® program. Individual prints may be marked with a stamp or preprinted self-adhesive labels, or by writing the project number and sequential number of each photograph and referencing the numbers in the field book, the Field Activity Log, or a dedicated photo log. Videos used for field documentation are to be identified by project title, project number, and description.

2.11 Subcontractor Preparedness Checklist

Prior to starting work, a review is to be made and documented of a subcontractor's preparedness to perform specified activities. This review may be documented on the Field Activities Log or on checklists that may be developed according to requirements for subcontracted work activities. Particular emphasis should be on site-specific issues that may require special consideration such as health and safety, access, and unique settings. These should be discussed in advance with the CPM and the client in developing and implementing the Scope of Work.

- END OF PROCEDURE -

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TGI – Sample Chain of Custody

Rev: 3

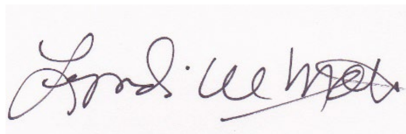
Rev Date: March 28, 2022

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	April 19, 2017	All	Re-write to COC only	Richard Murphy
	1	May 23, 2017	4,7,9	Add: Guidance on use of previous version of TGI. Add: Info on COCs for multiple shipping containers Modify: Move letter i. to letter m. and change to "when appropriate"	Peter Frederick
	2	April 29, 2020	4, 11	Remove obsolete link	Lyndi Mott
	3	December 28, 2022	All	Updated Arcadis format Added to 6c. Collection time between COC and container must match. Added to 6o. Add name of overnight courier when relinquishing samples. Updated reference documents and added internet links.	Lyndi Mott

Approval Signatures

Prepared by:



3/28/2022

Lyndi Mott (Preparer) — Date

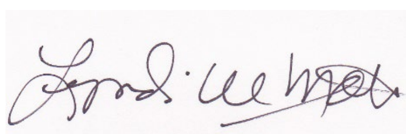
Reviewed by:

Dennis K. Capria

3/28/2022

Dennis Capria (Chain of Custody Reviewer) — Date

Reviewed by:



12/22/2021

Lyndi Mott (Subject Matter Expert) — Date

1 Introduction

This Technical Guidance Instruction (TGI) provides the procedure for Arcadis field personnel for required documentation during the collection of environmental field samples and transfer of custody to a laboratory. It provides direction for completion of the Chain of Custody form that must accompany collected field samples for analysis by a laboratory.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

This TGI describes the general Chain of Custody (COC) procedures and guidance instructions for samples collected from project sites that are relinquished from Arcadis' possession.

COC is defined as the maintenance of an unbroken record of possession of an item from the time of its collection through some analytical or testing procedure. COC is typically documented by a written record of the collection, possession, and handling of samples collected from a project location. Each sample will be tracked by a documented record that efficiently documents the individuals who were responsible for the sample during each successive transfer of that sample to various recipients beyond Arcadis' possession. This information can be used to legally establish the integrity of the samples and therefore the analytical results derived from the samples. This information can be used in addition to other records and documentation regarding the samples, such as field forms, field logs, and photographs.

A sample is considered under custody if:

- It is in your possession; or
- It is in your view, after being in your possession; or
- It was in your possession and then you then locked it up to prevent tampering; or
- It is in a designated secure area.

Continued use of previous version of TGI:

Although not recommended, Arcadis program-, project-, and client-teams may be able to use the previous version of this TGI provided that it meets all of the quality expectations of Arcadis and client and meets applicable regulatory requirements. It is up to the program, project, and/or client-team leader to determine whether it is appropriate to adopt the current TGI or to continue using the previous version.

However, all new work not associated with the previous version of this TGI must be performed with the current version of the TGI.

When adopting this new TGI, users of the previous versions must be aware that specific handling, packing, and shipping procedures and guidance has been removed and that those should be addressed within program or project plans (e.g., Quality Assurance Project Plans (QAPP), Work Plans, Sampling and Analysis Plans (SAPs), etc.) or in a more detailed TGI specific to that sampling activity, whether related to media, constituent/analyte, client, state, etc.

In addition, adopting this new TGI will require users to refer to the Arcadis Department of Transportation (DOT) Safety Program for procedures and guidance on the determination and handling, packing, and shipping of samples that are or may be considered hazardous materials.

4 Personnel Qualifications

Arcadis personnel performing work under the purview of this TGI will have received appropriate training and have field experience regarding the collection of samples from project locations. Arcadis personnel will have all other applicable and appropriate training relevant to the sampling work and project site.

5 Equipment List

The following list provides materials that may be required for each COC. Project reporting and documentation requirements must be reviewed with the CPM prior to execution of work. Additional materials, tools, equipment, etc. may be required, and project staff are required to verify with the CPM and/or Technical Expert what specific equipment is required to complete the COC.

- Indelible ink pen (preferably either black or blue ink);
- COC form **(Appendix A)** from either Arcadis, laboratory receiving and analyzing the samples, or other applicable and appropriate entity for the work performed;
- When appropriate, such as for litigation or expert testimony work, custody seals or tape.

6 Cautions

One way in which the law tries to ensure the integrity of evidence is by requiring proof of the chain of custody by the party who is seeking to introduce a particular piece of evidence.

A proper chain of custody requires three types of affirmations: (1) affirmation that a sample is what it purports to be (for example, soil collected from a specified location and depth); (2) affirmation of continuous possession by each individual who has had possession of the sample from the time it is collected until the time it is analyzed or held by a laboratory; and (3) affirmation by each person who has had possession that sample remained in substantially the same condition and not contaminated or affected by outside influences from the moment one person took possession until the moment that person released the evidence into the custody of another (for example, affirmation that the sample was stored in a secure location where no one but the person in custody had access to it).

Proving chain of custody is necessary to "lay a foundation" for the samples in question, by showing the absence of alteration, substitution, or change of condition.

Ensure that appropriate sample containers with applicable preservatives, coolers, and packing material are planned for and provided at the site at the time of sample collection.

Understand the offsite transfer requirements of the samples for the facility at which samples are collected.

If overnight courier service is required schedule pick-up or know where the drop-off service center is located and the hours of operation.

An Arcadis employee appropriately trained at the correct level of internal hazardous materials/DOT)shipping must complete an Arcadis shipping determination to address applicable DOT and International Air Transport Association (IATA) shipping requirements. Review the applicable Arcadis procedures and guidance instructions for sample packaging, and labeling. Prior to using air transportation, confirm air shipment is acceptable under DOT and IATA regulations.

The person relinquishing possession of the samples or other member of the project team should contact the final recipient of the samples to confirm receipt and review any special provisions on the COC or questions that they may have.

7 Health and Safety Considerations

Follow the health and safety procedures outlined in the project/site Health and Safety Plan (HASP) as well as other applicable H&S requirements, such as:

- Arcadis Hazardous Material/DOT handling, packaging, and shipping training
- Project site-specific H&S training
- Client-specific H&S training
- Constituent-specific H&S training
- Media-specific H&S training

8 Procedure

Collected samples must be uniquely identified, and properly documented, containerized, labeled with unique identifier, possessed in a secure manner during remainder of sampling event, packaged, and shipped to recipient laboratory.

Sample Identification

The method of sample identification depends on the type of measurement or analyses performed. In some cases, in-situ measurements of existing conditions and/or sample location must be made during sample collection.

These data will be recorded directly on field forms, logbooks, or other project record data sheets used to permanently retain this information for the project file. Examples of location identification information includes: latitude/longitudinal measurements, compass directions, well number, building number, floor number, room name, or proximity to a site feature unique to the site. Examples of in-situ measurements are pH, temperature, conductivity, flow measurement, or physical condition of the media being sampled. Physical samples collected are identified by a unique identifying number or code on a sample tag or label. These physical samples are removed from the sample location and transported to a laboratory for analyses.

In some cases, before samples are placed into individual containers and labeled as individual samples, samples may be separated into portions depending upon the analytical methods and required duplicate or triplicate analyses to be performed.

When completing a COC for samples, personnel must complete the following:

1. Written COCs must be completed with indelible ink (preferably either black or blue colored ink).
2. Written COCs must be completed using legible printed writing, and not cursive writing.
3. All entry fields on the COC form must be completed. If information is not applicable for a specific entry field, personnel will either put "N/A" or use a strike-out line or dash like "-----------" to indicate no applicable information is needed for that field.
4. Use of quotation marks or lines/down arrows to represent repetitive/duplicative text in similar fields.
5. Regardless of the type or specific COC form, the following pertinent information must be provided on the COC form:
    a. Arcadis project number
    b. Arcadis project name
    c. Project location, including street address, city, state, building number, providing as much detail as appropriate
    d. Recipient laboratory contact and sample receiving shipping location information
    e. Entities'/persons' contact information for who will be receiving analytical results
    f. Name of sampler, i.e., person collecting sample and relinquishing possession of samples to the next entity in the chain of custody
    g. Date of sample collection
    h. If appropriate for the sample media, contaminant/constituent of concern, or analytical method, document time of sample collection using standard military time
    i. Sample analytical method(s)

j. Turnaround time required for analyses and/or reporting

k. Instructions to laboratory regarding handling, timing, analyses, etc. as applicable and appropriate.

l. Printed name and signature of the individual person who collected the samples and relinquishing possession of the samples

m. If appropriate or when documentation of the specific sample collection method will influence how the laboratory handles, prepares, or analyzes the samples, document the sample collection methodology used for collecting the samples (e.g., ASTM D5755)

6. The following additional specific information will be entered on the COC form, regardless of what type of COC is being used:

   a. Unique Sample Identifier – The sample identifier (ID) must be unique to the individual sample it is applied to. The information in which the sample ID conveys is determined by the CPM, Technical Expert, and/or other project team members in advance of sample collection so that sample identification is consistently applied for the project. The sample nomenclature may be dictated by a specific client, program, or project database and require unique identification for each sample collected for the project. Consult with the CPM and/or Technical Expert for additional information regarding sample identification.

      The sample ID could convey specific information regarding the sample to aid personnel in recognizing what the sample represents, or they may be arbitrary so as to facilitate the anonymity of the sample location, media, constituent of concern, project site, etc.

      Examples of unique identifiers include:

      1. Well locations, grid points, or soil boring identification numbers (e.g., MW-3, X-20, SB-30). When the depth interval is included, the complete sample ID would be “SB-30 (0.5-1.0) where the depth interval is in feet. Please note it is very important that the use of hyphens in sample names and depth units (i.e., feet or inches) remain consistent for all samples entered on the chain of custody form. DO NOT use the apostrophe or quotes in the sample ID.

      2. Sample names may also use the abbreviations “FB,” “TB,” “FD” and “DUP” as prefixes or suffixes to indicate that the sample is a field blank, trip blank, or field duplicate, respectively.

   b. List the date of sample collection. All indicated dates must be formatted using either mm/dd/yy (e.g., 03/07/09) or mm/dd/yyyy (e.g., 03/07/2009).

   c. List the local time that the sample was collected. The time value should be presented using military format. For example, 3:15 P.M. should be entered as 15:15. The time listed on the COC form must match the sample collection time on the sample container(s).

   d. Samples should be indicated to be either “Grab” or “Composite”. Grab samples are collected from only one unique location at one specific point in time.

   e. Composite samples are a group of individual samples that are combined for analysis in their totality. Composite samples need to be documented if they are either collected from a number of different locations over a broader area to be representative of the entire area being sampled, or if they are representative of a single location over an extended period of time.

f. If used, preservatives for the individual sample will be noted.

g. The requested analytical method(s) that the samples are being analyzed for must be indicated. As much detail, as necessary, should be presented to allow the analytical laboratory to properly analyze the samples. For example, polychlorinated biphenyl (PCB) analyses may be represented by entering "EPA Method 8082 – PCBs" or "EPA PLM 600-R93-116." In cases where multiple analytical methods and/or analytical parameters are required for an individual sample, each method should be indicated for the sample (e.g., EPA 8082/8260/8270 or EPA PLM/400-point count).

h. If there are project-specific sample analytes to be reported, they should be specifically listed for each individual sample (e.g., 40 CFR 264 Appendix IX).

i. The total number of containers for each analytical method requested should be documented. This information may be included under the parameter or as a total for the sample.

j. When necessary, note which samples should be used for site specific matrix spikes in the Remarks or Comments field.

k. Indicate special project-specific requirements pertinent to the handling, shipping, or analyses. These requirements may be on a per sample basis such as "extract and hold sample until notified," or may be used to inform the laboratory of special reporting requirements for the entire sample delivery group (SDG).

l. Indicate turnaround time (TAT) required for samples on COC. If individual samples have differing TATs, the different TATs for each sample or groups of samples must be clearly indicated.

m. Provide contact name and phone number in the event that problems are encountered when samples are received at the laboratory. The person relinquishing possession of the samples or other member of the project team should contact the final recipient of the samples to confirm receipt and review any special provisions on the COC or questions that they may have.

n. If available, attach the Laboratory Task Order or Work Authorization forms.

o. The "Relinquished By" field must contain the signature of the Arcadis person who relinquished custody of the samples to the next entity in the chain of custody, which may be another person, the shipping courier, or the analytical laboratory. If a courier, enter the shipping courier in the "Received by" such as FedEx. The date/time relinquished should be when the person signs the COC and seals the cooler or shipping container for pick-up by the shipping courier.

p. Dates and times must be indicated using the following format:

   1) Date: either mm/dd/yy e.g., 01/01/17 OR mm/dd/yyyy e.g., 01/01/2017

   2) Time: use military format, e.g., 9:30 a.m. is 0930 and 9:30 p.m. is 2130

q. The "Received By" section is signed by sample courier or laboratory representative who received the samples from the sampler. The laboratory will sign upon laboratory receipt from the overnight courier service.

7. When more than one page of the COC form is required to complete the total number of samples, use as many sheets as necessary to accurately and clearly, document the samples and information. Some COCs may have a standard first page/cover page, and subsequent pages may not contain all the detailed fields as

the first page/cover page. Ensure that any subsequent pages convey all of the necessary and pertinent information for each individual sample as required in this procedure document.

8. Pages of the COC must retain a page count of the total number of pages; e.g., Page 1 of 3, Page 2 of 3, Page 3 of 3.
9. Upon completing the COC forms, forward the original signed COC with the sample package. Ensure that the original COC form is secured with the sample package so that it remains with the physical samples for the duration of transport and handling to its final destination and ensure that the COC form will not be become damaged or rendered unreadable due to sample breakage/leakage if stored inside the sample shipping container or outside influences if COC is stored in an outside plastic pouch to the container.
10. If you've collected enough samples that would require more than one container to ship them all to the same laboratory or location, then each separate/individual container that contains any number of samples must have a separate COC representing only those samples contained within that specific container. For example, if you have 3 total shipping containers for all of your samples, you must have a total of 3 separate, individual COCs for each of the 3 containers representing only those samples in their representative container. Thus, every container holding samples must have its own, individual COC.
11. If electronic chain of custody (eCOC) forms are utilized, ensure that the requirements of this procedure and guidance instructions are followed to the extent possible. Verify that proper signature and COC procedures are maintained with the CPM and/or Technical Expert when using eCOC.

9 Waste Management

Not Applicable.

10 Data Recording and Management

The original signed COC shall be submitted with the samples. Copies of COC records will be transmitted to the CPM or designee at the end of each day unless otherwise directed by the CPM. The sampling team leader retains copies of the chain of custody forms for filing in the project file. Record retention shall be in accordance with client- and project-specific requirements and Arcadis policies, the most stringent will apply.

The option to use the Electronic Chain of Custody (eCOC) form in conjunction with the appropriate sample application(s) may be available through the FieldNow® program but is currently limited to a select list of approved analytical laboratories. Use of the eCOC application is intended to reduce common transcription errors both by field staff and laboratory staff on a conventional handwritten paper COC. Once the eCOC form is completed and approved on the field tablet by field staff, a PDF version of the form is automatically emailed to each assigned team member. In addition, a dedicated or mobile printer is recommended for printing a hard copy of the completed eCOC to be included in each sample cooler to meet laboratory requirements.

11 Quality Assurance

COC forms will be legibly completed in accordance with this procedure and guidance instruction document, as well as other applicable and appropriate project documents such as SAP, Quality QAPP, Work Plan, or other project guidance documents.

COC records will be reviewed by the CPM or their appropriate designee for completeness and accuracy to the applicable requirements. Non-conformances will be noted and corrected in a timely manner on the copies retained by Arcadis as well as contacting the ultimate receiving entity for correction to the originally signed COC in their possession.

12 References

Arcadis Transportation Safety Program requirements, procedures, and guidance instructions.

EPA Samplers' Guide – Contract Laboratory Program Guidance for Field Samplers, EPA document EPA-540-R014-013 October 2014 https://www.epa.gov/sites/default/files/2015-03/documents/samplers_guide.pdf.

EPA Region III – Sample Submission Procedures for the Office of Analytical Services and Quality Assurance (OASQA) Laboratory Branch revision 14.0 October 18, 2018, https://www.epa.gov/sites/default/files/2018-12/documents/sample-submission-procedures-rev14.pdf.

EPA Region IV Science and Ecosystem Support Division Operating Procedure for Sample and Evidence Management May 25, 2016, https://www.epa.gov/sites/default/files/2015-06/documents/Sample-and-Evidence-Management.pdf.

Attachment A

Chain of Custody and Laboratory Analysis Request Form

ARCADIS

ID#

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page ____ of ____

Lab Work Order #

Send Results to:			
Contact & Company Name:	Telephone:	Preservative	
Address:	Fax:	Filtered (✓)	
City State Zip	E-mail Address:	# of Containers	
Project Name/Location (City, State):	Project #:	Container Information	
Sampler's Printed Name:	Sampler's Signature	PARAMETER ANALYSIS & METHOD	

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: ______
G. Other: ______
H. Other: ______

Containment Information Key
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: ______
10. Other: _______

Matrix Key:
SO - Soil
W - Water
T - Tissue
SE - Sediment
SL - Sludge
A - Air
NL - NAPL/Oil
SW - Sample Wipe
Other: ________

SAMPLE ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix										REMARKS

Special Instructions/Comments

☐ **Special QA/QC Instructions (✓)**

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Last Name:	Cooler Custody Seal (✓)	Printed Name:	Printed Name:	Printed Name:	Printed Name
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt	Firm:	Firm:	Firm:	Firm:
Shipping Tracking #:	Condition/Cooler Temp:______	Date/Time:	Date/Time:	Date/Time:	Date/Time:

SOP – Sample Chain of Custody Rev1_May 23, 2017

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Table of Contents

QUICK SHEET

Applicability

This HSS assigns responsibilities and expectations for proper utility location and clearance by both Arcadis employees and Arcadis subcontractors at project sites

Need to Know

PMs are responsible for ensuring the requirements of this HSS are followed. Project personnel are responsible for understanding the HSS and Supplemental document, having the minimum 1 year of required training in order to clear sites, understand and apply the requirement for a minimum three reliable lines of evidence for each point of work, know and understand the Arcadis 30-in tolerance Zone requirements.

If and when any line of evidence reveals planned subsurface work will occur within the Arcadis 30-inch Tolerance Zone of known/marked/located/observed utilities or structures, the project team must Stop Work and contact Corporate H&S for a review of steps the team has taken to prevent injury or incident involving the conflict.

Additional details addressing hazards, risk factors, and safe work practices are discussed in the HSS Supplemental document Sections:

1. Best Practices for Project Managers (or Their Delegates) Concerning Utility Clearance.
2. Best Practices for Field Personnel Concerning Utility Clearance.
3. Use and Limitations of Common Underground Locating Technologies and Clearance Methods.
4. Best Practices for State One Call Notification Process and Mark Outs.
5. Emergency Action Plan Guidelines for Utility Strikes.
6. Utility Location Procedures for Aquatic Work Activities.

Arcadis field personnel involved with any strike incidents including contact with a structural feature, subsurface, submerged, and/or aboveground utilities must immediately STOP WORK and contact the Project Manager to discuss the incident. If there are life threatening injuries, or the incident presents a risk to public safety (e.g. natural gas leak, downed live electrical line, flooding, or an unstable building) first call 911 or the available emergency services number for the client site or area and then call the Project Manager. The incident must be reported to Corporate Health and Safety immediately and no later than 24 hours after gaining knowledge of the incident. Compliant notification within 24 hrs. requires an acknowledgement of the notification by Corporate H&S.

The Arcadis standard client and subcontractor contracts contain required terms and conditions defining responsibility for utility clearance and the allocation of risk associated with an impacted utility.

Training

Field staff must complete a minimum of one year of utility clearance-related experience before accepting responsibility for any utility clearance tasks. This experience requires mentorship by a currently trained and experienced Arcadis employee for the processes of; completing DigSafe 811 notifications, developing a working understanding of the types of utilities present at project sites, developing a working understanding of the various reliable lines of evidence, and participating in on-site training led by another Arcadis employee with detailed knowledge and experience in identifying utilities and structures.

Permits or Forms Required

The Utility Location HSS and associated supplements will be reviewed, and the Utility and Structures Checklist will be prepared during project planning to document and record the location and clearance process for the Site.

1. POLICY

It is the practice of Arcadis and its affiliated companies to implement appropriate, reasonable, and practical standards within acceptable and customary industry practices to promote the health and safety of its employees and avoid and mitigate exposure of risk in the performance of their work. In furtherance of this policy, Arcadis promotes and encourages compliance by all employees with this policy and standards relating to work in the vicinity of subsurface, submerged, or aboveground utilities.

2. PURPOSE AND SCOPE

2.1 Purpose

Arcadis is committed to providing a healthy and safe work environment for our employees, subcontractors, clients, and visitors. To this end, this health and safety standard (HSS) establishes general safety standards and best practices associated with the identification, management and avoidance of subsurface, submerged, and aboveground structures and utilities on project sites.

2.2 Scope

This HSS assigns responsibilities and expectations for proper utility location and clearance by both Arcadis employees and Arcadis subcontractors at project sites.

3. DEFINITIONS

Definitions related to Utility Location and Clearance can be found in Exhibit 1. Acronyms and Abbreviations are found in Exhibit 2.

4. RESPONSIBILITIES

Project staff involved in subsurface and aboveground work activities are expected to read, understanding and comply with this HSS and the ARC HSFS-019 Supplements, specifically ARC HSFS-019 Supplement Sections 2 and 3, make the required DigSafe notification(s), and complete the appropriate checklists during the on-site utility and structures locate and clearance process.

4.1 Project Managers

For every project site having the potential to come into contact with utilities, Project Managers (PMs) are responsible for the requirements of this HSS in that:

- The requirements of this HSS are followed.
- Local regulations governing utility clearance are followed. This includes ensuring local and/or state laws defining activities or depth of intrusive work/excavation requiring utility clearance are reviewed as they vary by location. For further information, refer to the

Common Ground Alliance One Call State Law Directory (https://commongroundalliance.com/map).

- Efforts are made to work with the client, project site representatives, public utility companies, and subcontractors to identify the nature of any utilities and to determine control processes that need to be implemented by Arcadis and the subcontractors to prevent damage to these utilities and to properly manage the effects in the event there is utility damage.

- In jurisdictions where the actual contractor performing the subsurface intrusive work is required to perform utility clearance notifications (811, State One Call, etc.) ***and*** Arcadis is also self-performing the work, Arcadis will complete the clearance notifications and include the ticket number on the Utility Clearance Checklist. Refer to ARC HSFS-019 Supplement Section 4 for Best Practices for State One Call procedures.

- Utility clearance activities are only delegated to a Task Manager or other individual meeting the requirements of Section 4.2 below, as appropriate. However, even if the Project Manager delegates certain responsibilities, the Project Manager maintains primary responsibility for the completion of utility clearance. For additional information on Project Manager responsibilities and best practices, refer to ARC HSFS-019 Supplement 1.

- Prior to beginning subsurface work, Project Managers or designee must review the Utility and Structures Checklist with staff and Arcadis subcontractors (including subs of subs). The Project Manager or designee review must be documented on the Utility and Structures Checklist prior to starting subsurface intrusive work

4.2 Field Personnel Responsibilities

Arcadis field personnel conducting work on a project site having the potential to come into contact with utilities have the responsibility to:

- Read, understand, and follow this HSS and ARC HSFS-019 Supplement document.

- Complete a minimum of one year of utility clearance-related experience before accepting responsibility for any utility clearance tasks. This experience requires mentorship for notifying DigSafe 811, developing a working understanding of the types of utilities present at project sites, developing a working understanding of the various reliable lines of evidence, and participating in on-site training led by another Arcadis employee with detailed knowledge and experience in identifying utilities and structures.

- Request and review the 811 DigSafe notification(s) in place for the appropriate work area(s).

- Prior to beginning any subsurface intrusive work (i.e., any work or activity that breaks the plane of the ground surface), excavation work involving heavy and mechanized equipment, or operating high clearance equipment at the Site, the Utility and Structures Checklist must be completed and signed by the staff member completing or overseeing the clearance. Confirm that the Utility and Structures Checklist was reviewed by the Project Manager or designee as discussed in Section 4.1 above. Review the Utility and Structures Checklist daily prior to starting subsurface intrusive activities to ensure all utilities are identified and markings are present. A copy of the completed Utility and Structures Checklist will remain on-site during all subsurface intrusive work.

- Use their STOP WORK Authority to eliminate any reasonable concern if utilities cannot be reasonably located and contact the Project Manager to review the STOP WORK situation and confirm the direction of action before proceeding with the work.

- Check that Arcadis subcontractors conduct their own reasonable independent utility clearance efforts as required by state and local laws and the Arcadis subcontractor agreement.

- Be on-site and provide oversight during utility location and clearance activities and any active subsurface intrusive work or activities involving subcontractor under contract to Arcadis.

- If a utility is damaged and repaired during the course of the field event, Arcadis field staff must provide oversight and document that the repair was tested to ensure the repaired utility is competent and complete to prevent further damage to the site when the damaged utility is re-activated.

4.3 Corporate Health & Safety

Corporate H&S is responsible for keeping this HSS up to date with regulatory requirements and best work practices.

Corporate H&S will, as requested, provide guidance to employees and their supervisors engaged in work involving utility location and clearance on the risks and measures prevention utility strikes, including how to recognize the presence of utilities whether overhead, underground, or submerged and how to mark and protect them from damage.

4.4 Arcadis Subcontractor Responsibilities

According to the Arcadis standard subcontract terms and conditions, subcontractors agree to take responsibility for any damages resulting from a utility impact caused by their work. Therefore, Arcadis subcontractors are expected to take reasonable time and diligence to conduct their own independent utility clearance using reasonable standards and processes. Subcontractors have the responsibility to stop their work if utility concerns are identified and will report those concerns to the Arcadis employee overseeing their work activities. Arcadis staff should reinforce these responsibilities with subcontractors during job safety briefings.

In jurisdictions where the actual contractor performing the subsurface intrusive work is required to perform utility clearance notifications (811, State One Call, etc.), the contractor will perform the clearance notification and will provide evidence of the notification to Arcadis (ticket or ticket number, etc.). Refer to ARC HSFS-019 Supplement Section 4 for Best Practices for State One Call procedures.

- If overhead utilities are present in areas where heavy equipment will be operated, ensure adequate clearance is provided. For heavy equipment with extendable or telescoping (e.g., excavators, dump trucks, extendable lift trucks) equipment, evaluate whether the use of a spotter is necessary prior to operating heavy equipment when in proximity to the overhead utility.

- Consider signage and/or other forms of identification to ensure aboveground and overhead utilities that need to be protected during Arcadis work are effectively addressed.

- If a utility is struck and requires repair, the repair must be tested prior to restoring the utility to full service.

5. PROCEDURE

5.1 General Safe Work Practices

Arcadis staff will follow these general safe work practices when working around utilities. Procedures to be followed during utility and structures location and clearance activities are outlined in the following sections of the Utility Location and Clearance Supplemental document:

7. Best Practices for Project Managers (or Their Delegates) Concerning Utility Clearance.
8. Best Practices for Field Personnel Concerning Utility Clearance.
9. Use and Limitations of Common Underground Locating Technologies and Clearance Methods.
10. Best Practices for State One Call Notification Process and Mark Outs.
11. Emergency Action Plan Guidelines for Utility Strikes.
12. Utility Location Procedures for Aquatic Work Activities.

5.2 Lines of Evidence

When locating utilities and structures three (3) reliable "lines of evidence" must be established to help determine where a subsurface utility may be located. A line of evidence may be a scaled site drawing showing where a utility is located, it could be information obtained verbally from owners or employees who meet the definition of a "knowledgeable person" regarding utility and structural features, it could be established using any number of non-intrusive geophysical methods including but not limited to; ground penetrating radar (GPR), electromagnetic survey (EM), radio-frequency methods (RF), or it could involve probing for or exposing the utility by soft dig technologies (AKA "daylighting" or "potholing") using air knife, Hydroknife and/or soil vacuum. Some lines of evidence will identify utility locations with a high degree of certainty (e.g., direct connect radio-frequency technique, daylighting, or potholing, sonde tracing, etc.). Other lines of evidence will identify utilities will less certainty (e.g., GPR, historical reports, old design drawings, etc.).

Effective utility locate practices must use multiple lines of evidence until there is a high degree of certainty that the various underground utility services have been adequately located. A minimum of three (3) reliable lines of evidence are required for an appropriate utility clearance as defined in this HSS. All reliable lines of evidence used during the utility clearance procedure will be recorded on the Utility and Structures Checklist or equivalent client-provided checklist or ground disturbance permit. If three (3) reliable lines of evidence have not established certainty regarding the location of a utility, STOP WORK and do not proceed until the certainty has improved, the work has been modified to resolve the lack of certainty. Additional reliable lines of evidence must be utilized until the presence or absence of the underground utility can be established. During work activities, if a line of evidence is lost or not apparent (e.g., paint markings have faded), STOP WORK, and re-establish the line of evidence prior to resuming subsurface intrusive work.

Generally, the following example reliable lines of evidence may be used to meet the minimum three lines utility clearance requirement:

1. Contacting the State One Call or equivalent service (Nationwide "811") in advance of intrusive work is **REQUIRED BY LAW**.. Contacting the State One Call or equivalent service (Nationwide "811") is an acceptable reliable line of evidence when working within or adjacent to the public right of way or easement. Note that the State One Call can provide valuable information regarding locations and types of utilities entering a privately owned property.

   Note: When conducting work on private property or in areas not served by State One Call or equivalent service, teams are to evaluate using a reputable private utility locating company to locate and mark the utilities. **Use of a reputable private utility locator is encouraged for all projects with subsurface or submerged utilities.** When working with a private utility location subcontractor, it is best practice to pre-plan clearance areas, review the necessary clearance equipment needed based on the types of utilities anticipated to be present, and the re-clearing/confirmation of any public utility location markings (State One Call or equivalent service Nationwide "811").

2. Use detailed, scaled site utility plans, preferably in the form of an "as-built" or "record" drawing, to identify and/or confirm utility locations. Document request and/or receipt of utility drawings from the property owner/client on the Utilities and Structures Checklist.

3. Interview(s) with knowledgeable site or client personnel. The following questions should be asked during the interview and answers documented on the Utility and Structures Checklist

   - Employees(s) Name and Affiliation(s) with the site.
   - Types of utilities, including utility composition and location of utilities on-site.
   - Depths of known utilities; and
   - Any other pertinent information regarding utilities on the site.

4. Conduct a detailed visual site inspection of areas around all planned subsurface intrusive work points or areas to identify and/or confirm utility locations. The area needed to conduct a thorough site inspection can vary significantly depending on the number and type of utilities present, notably gravity-fed utilities such as sewers. Sewer network manhole spacing can often include 100-foot distances or greater between manholes. For underground utilities, conduct an inspection for structures that tend to indicate the presence and general location of such utilities, including, but not limited to manholes, vaults, valve covers, valve markers, telephone pedestals, transformer housings, fire hydrants, fire suppression post indicator valves (PIVs), spigots, sprinkler heads, air relief valves, backflow preventers, meters, vent lines, downspouts going into the subsurface, power poles with wiring going into the subsurface and line markers, stakes, and monuments. Saw cut lines and concrete/asphalt repairs often yield valuable information regarding utility locations.

Always discuss the presence of utilities with the site owner, operator, facility representative and/or occupant to identify any potential utilities that might not be readily identified by non-intrusive geophysical clearing methods. Situations where non-intrusive clearance methods may not be effective include:

- Depths > 5 ft. below ground surface (BGS).
- Small diameter or certain utility construction materials (e.g. plastics).
- Multiple layers of surface cover e.g. reinforced concrete, multiple layers of historical roadbed.
- Soil conditions such as dense soils or shallow groundwater table.

A discussion of use and limitations associated with common utility location and clearance geophysical methods is provided in ARC HSFS-019 Supplement Section 3.

Standard operating procedures for utility location in submerged settings are presented in ARC HSFS-019 Supplement Section 6.

The lines of evidence will be recorded on the Utility and Structures Checklist or equivalent client-provided checklist or permit.

Note: If a line of evidence is lost, not apparent, no longer applicable or utility location markings are removed/worn/unclear, or area of previous clearance is not confirmed, STOP WORK and re-establish the line(s) of evidence prior to resuming subsurface intrusive work. **Each location of subsurface intrusive work must have a minimum of 3 reliable lines of evidence.** All lines of evidence used during the utility clearance procedure will be recorded on the Utility and Structures Checklist or equivalent client-provided checklist or permit. The Utility Structures and Checklist is valid for 15 business days from the date of completion. Prior to the end of the 15 day period the checklist detailing the utilities which have been located and marked must be reviewed to verify no new utilities have been identified but are unmarked and, utilities which have been located and marked continue to be clearly marked. Update the checklist with the date of the review and reviewer name to “re-set” the 15-day period. A copy of the completed Utility and Structures Checklist will remain onsite while work involving or in the vicinity of utilities is conducted.

Caution: If and when any line of evidence reveals planned subsurface work will occur within the Arcadis 30-inch Tolerance Zone of known/marked/located/observed utilities, the project team must Stop Work and contact Corporate H&S for a review of the steps the team has taken to prevent injury or incident involving the utility conflict.

5.3 Color Codes Used for Utility Markings

The following colors are used for marking utilities. Some government agencies or large industrial facilities may use additional colors not provided below. Arcadis policy is to assume any paint marking or pin flag color not provided below is a subsurface utility marking until proven otherwise.

If utilities or subsurface anomalies are identified but the utility type or anomalies are not classified, it is recommended the color pink (Temporary Survey Marking) be used to mark the location pending confirmation. Once the type of utility is established, the pink marks will be repainted/remarked to represent the correct type of utility.

COLOR	Utility Line
WHITE	Proposed Excavation
PINK	Temporary Survey Markings
RED	Electrical Power Lines, Cables, Conduit and Lighting Cables
YELLOW	Gas, Oil, Steam, Petroleum or Gaseous Materials
ORANGE	Communication, Alarm or Signal Lines, Cables or Conduit
BLUE	Potable Water
PURPLE	Reclaimed Water, Irrigation and Slurry Lines
GREEN	Sewer and Drain Lines

APWA and ANSI standard Z-53.1

5.4 Locating Technologies

There are several types of locating technologies that can be used to identify and locate utilities in the subsurface. Project teams need to work closely with private utility locators (PUL) in order to best match locating technology with site conditions. To provide the best results, all possible locating technologies should be available for use and implementation at the project location. Any potential interferences should also be discussed up front and then at the project site during utility location activities. Potential interferences could be soil moisture, soil type, standing water on concrete/asphalt, rebar, fencing, and metal structures that are in the subsurface. Employees overseeing locating technology activities should have an understanding of device operation and limitations. For further information, refer to ARC HSFS-019 Supplement Section 3, Use and Limitations of Common Utility Location Technologies and Clearance Methods.

5.5 Clearance Methods

In some cases, proposed subsurface intrusive locations may be pre-cleared using other intrusive methods. Determine the clearance or soft dig method based on-site conditions and utilize the least invasive method possible. The number of subsurface intrusive locations and soil type should be taken into consideration. The following clearance methods are listed from least invasive to most invasive:

1. Vacuum Extraction/Potholing (air or water-based)
2. Air knifing
3. Hydro knifing
4. Probing
5. Hand augering
6. Hand digging
7. Posthole digging

"Single-Point" clearance involves clearing the intrusive location to 110% of the proposed subsurface intrusive area or the diameter plus 2 inches of the largest piece of tooling used in the subsurface (e.g. clear the borehole to 10-in. when setting wells using 8-in. hollow stem auger tooling), or whichever is greater.

"Three-Point" clearance involves clearing the utility using a triangular pattern placed around the proposed borehole location and in a configuration such as to not allow utilities to pass undetected between the clearance boreholes. In some cases, it is more practical to advance three individual slot trenches which connect at each end making a "clearance triangle" instead of advancing multiple boreholes side-by-side. Using the Three-Point clearance triangle trenching method allows for teams to inspect larger areas for potential utilities. The teams can advance trenches along each side of the proposed work area extending down to a target depth based on suspected depth of utilities at the Site. Each method of clearance will be documented on the Utility and Structures Checklist.

Manual clearing methods, such as shoveling, using pickaxes, digging bars (AKA "Spud bars" and other hand tools, should be avoided completely or only used when absolutely necessary and used with caution. Excessive downward force, prying or use in poor/obstructed visibility conditions is prohibited as these tools are known to be capable of damaging utilities.

Surface cover (e.g., asphalt) removal methods that pose excessive downward force, such as jackhammering, must be used with extreme caution. Methods that only cut the surface cover (coring or saw cutting) present less risk due to the absence of the blunt downward force, which could cause collateral damage to shallow subsurface utilities by unintentionally pushing buried debris into the utility. Note that certain utilities are often present at the concrete or pavement/soil interface or encased within the concrete or pavement and are easily damaged during concrete coring or pavement removal. Always work slowly, methodically, and frequently STOP WORK to evaluate conditions during these work activities.

For borings and excavations, if the utility is known to be at depths where hand clearing is not feasible or creates additional safety concerns, no work will be performed within the Arcadis 30-inch Tolerance Zone vertically or horizontally of the utility unless manual clearing of the utility is performed under the oversight of an Excavation Competent Person as defined in ARC HSCS005 HSS Arcadis Excavation and Trenching.

5.5.1 Temporary Backfilling of Pre-Cleared Boreholes

In some cases, it may be necessary to temporarily backfill a pre-cleared / daylighted location until the remaining subsurface activities are performed. At these locations where subsurface intrusive work does not immediately follow pre-clearance, it is important to properly backfill and mark the pre-cleared location in order to protect the utility integrity and maintain the location. In general, wooden stakes, survey flags, whisker markers, paint marking, or other surface markings alone are inadequate because these markings can be easily removed, damaged, or otherwise lost creating uncertainty for the pre-cleared location. Although the specific steps for backfilling a pre-cleared location will depend on site-specific conditions, use the following steps to prevent loss of the pre-cleared location:

- Backfill a pre-cleared location with clean sand or other granular material that is recognizably different from the surrounding subsurface native material. Native soil should not be used to backfill a pre-cleared location that may require further subsurface work.

- Backfill the top 2 feet of a pre-cleared location with dyed sand or gravel to facilitate re-location.

- Place wooden stakes or delineators to mark locations as an additional measure, if practical.

- In the event that the pre-cleared borehole is located on asphalt or concrete and an asphalt cold patch is required, use white paint to mark the intrusive location over the asphalt cold patch.

- In some instances, such as projects potentially affected by unexploded ordinance (UXO), the pre-cleared borehole may require that a PVC pipe of matching diameter be inserted into the pre-cleared borehole, filled with clean sand and affixed with a matching cap. Project teams are to discuss client specific utility location and marking requirements with the project manager prior to conducting work.

- Always use a physical subsurface marker such as described above to identify the pre-cleared borehole location. Don't rely solely on field measurements or GPS coordinates as the only means for locating pre-cleared locations.

- If a utility or anomaly/obstruction is encountered during the pre-clearing process, backfill the hole with the native soil and mark the location with a pink-painted X and/or NO.

In the event that a previously pre-cleared location cannot be located, the location must be re-cleared prior to performing subsurface intrusive work

5.6 Clearance for Working in Vicinity of Subsurface Utilities – The Arcadis Utility Tolerance Zone

Prior to the start of subsurface intrusive activities (i.e., excavating / test pitting, drilling, installing grounding rods, manual soil sampling etc.), all utilities must be located, and steps taken to avoid unintentionally contacting or damaging subsurface utilities. See exemptions for subsurface intrusive work in Exhibit 1 (Definitions). Field Teams are not to procced with subsurface work involving utilities located within 30 inches of a line marking as measured radially (e.g. 360 degrees) from the outermost point of the marked utility. If only the centerline of the utility or utility bank is marked, but the utility width or diameter is known or suspected, the diameter of the utility or utility bank (Exhibit 1) must be incorporated into the Arcadis 30-inch Tolerance Zone, see Figure 1 located in Exhibit 2 for further instructions and an illustration of the Arcadis 30-in. Tolerance Zone.

If and when any line of evidence reveals planned subsurface work will occur within the Arcadis 30-inch Tolerance Zone of known/marked/located/observed utilities or structures, the project team must Stop Work and contact Corporate H&S for a review of steps the team has taken to prevent injury or incident involving the conflict.

If subsurface work using heavy or mechanized equipment must take place within the Arcadis 30-inch Tolerance Zone of the marked utility, the utility must be exposed (daylighted) using soft dig clearance methods prior to starting subsurface intrusive activities as described in Section 5.5 of this HSS.

Note: No heavy or mechanized equipment is permitted to be used within the Arcadis 30-inch Tolerance Zone for the purpose of daylighting the utility.

Once the utility in conflict has been daylighted, and heavy or mechanized equipment use is planned within the Arcadis 30-inch Tolerance Zone of the utility, such work must receive pre-approval by Corporate H&S to review steps the team has taken to assess and mitigate the risk associated with the planned work. Additional excavation safety procedures may have to be developed as part of the Corporate H&S approval to proceed. It should be noted that any disturbance within 30 inches of the marked utility, or disruption of the surrounding bedding materials could affect the integrity of the utility.

For horizontal borings, to avoid striking a utility, damage from vibration, damage by pressure of the advancing boring, do not drill within 30 inches in all directions (3-Dimensional cylinder) of a line marking. Make sure to factor the diameter of the line or utility bank when calculating the extent of the 30-inch Tolerance Zone. When crossing a utility during horizontal drilling, it is recommended that the utility be exposed 30 inches in a 360°-direction. When exposing utilities for horizontal borings, the utility must be exposed (potholed) by soft dig/clearance methods. This recommendation applies even if the operating contractor has technology that places the location to within a few inches. Make sure to factor the diameter of the utility when determining the 30-inch Tolerance Zone. If subsurface work must take place within the 30-inch Tolerance Zone of the line marking, the utility must be exposed (potholed) by soft dig/clearance methods prior to starting subsurface intrusive work (see Section 5.5 for options); no mechanized equipment is permitted for the exposing of the utility. Once the utility has been exposed, if mechanized equipment is planned for use within the 30-inch Tolerance Zone of the utility, such activity must receive pre-approval by Corporate H&S, as necessary, to mitigate or accept the risk associated with the planned work. Additional excavation safety procedures may have to be developed as part of the approval to proceed. It should be noted that any disturbance within the 30 inches or disruption of the bedding materials could affect the integrity of the utility.

Additional cautions for horizontal borings include gravity-fed utilities, such as sewers and storm drains. The depth of these utilities will change (sometimes significantly) as they run across the project site. Project teams need to obtain sewer utility depths in the work area(s) and determine the depth of the sewer at the location where the boring will actually intersect with the sewer line by collecting sewer pipe invert elevations from identified manholes and interpolating those depths to the area of the subsurface intrusive work.

During well installations and well abandonment via mechanical equipment, the Arcadis 30-inch Tolerance Zone rule applies in an outward direction extending from the outermost edge of the largest diameter auger or greatest width tool used for installation and abandonment (e.g. "over drilling"). In cases where wells have been previously installed and the 30-inch rule has not been followed, work proposed using heavy or mechanized equipment falling within the Arcadis 30-inch Tolerance Zone requires approval from Corporate H&S. For more information, see Figure 1 in Exhibit 2 for further instructions.

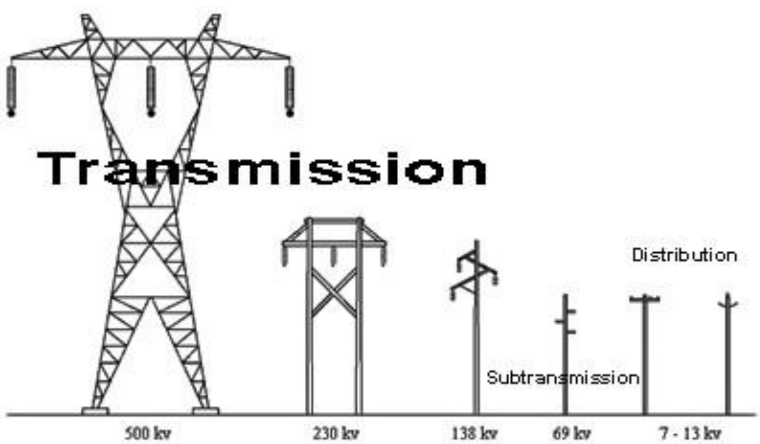
5.6.1 Aboveground Activities causing Subsurface Disturbance in the Vicinity of Underground Utilities

Aboveground work-related activities can cause damage to shallow underground utilities or structures. Asses the intended travel paths, mobilization, staging, and operation of heavy equipment and take steps to ensure shallow utilities are not damaged. If heavy equipment must cross over shallow utilities, the team is responsible for confirming the utilities will be protected.

Other subsurface disturbances may lead to damage such as removing trees/tree stumps, shrubs, or dense vegetation as roots may be entangled with underground piping or structures. For more information, see ARC HSFS-019 Supplement Section 2 Best Practices for Field Personnel Concerning Utility Clearance.

5.7 Acceptable Clearance for Working in Vicinity of Overhead Power Lines and Other Overhead Lines and Structures

No work will be performed by Arcadis or our subcontractor near overhead power lines where any Unqualified Person or equipment is within the limits specified below, unless the power line has been properly covered or de-energized by the owner or operator of the power line, or a qualified electrical subcontractor. Qualified Person approach distances are defined in Exhibit 5A and 5B of **ARC HSFS0006 Electrical Safety Standard**. Illustrations of general types of overhead utility conveyances are provided in **Exhibit 3** - Overhead Power Utility Illustrations



OSHA Electric Power etool illustration

Power Line Voltage Phase to phase (kV)	Minimum Safe Clearance (feet)
50 or below	10
Above 50 to 200	15
Above 200 to 350	20
Above 350 to 500	25
Above 500 to 750	35
Above 750 to 1,000	45

ANSI standard B30.5-1994, 5-3.4.5

5.7.1 Reducing Vehicle and Mechanical Equipment Clearance Requirements

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a minimum clearance of 10 feet (305 centimeters [cm]) is maintained. If the voltage is greater than 50 kilovolts (kV), the clearance shall be increased 4 inches (10 cm) for every 10 kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

- If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 feet (122 cm).
- If insulating barriers or “power line shields” rated for the voltage of the line being guarded are installed to prevent contact with the lines, and the barriers are not a part of, or an attachment to, the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.
- If the equipment is an aerial lift that is insulated for the voltage involved and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in OSHA 1910.333(c)(3)(ii)(C) Table S-5. Reference information from OSHA 1910.333 Table S-5 and NFPA 70E Table 130.4(C)(a) for alternating-current systems and 130.4(C)(b) for the distances associated with direct-current voltage systems is included as Exhibit 5 of ARC HSFS0006 Electrical Safety Standard.

Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments unless:

- The employee is using protective equipment rated for the voltage; or
- The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section of this HSS.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

When a machine is in contact with an overhead power line, do not allow anyone to come near or touch the machine. Stay away from the machine and summon outside assistance.

5.7.2 Acceptable Clearance for Working in Vicinity of Non-Electrical Overhead Utilities and Structures

Arcadis field personnel will identify non-electrical overhead utilities and structures and where possible, work is not be conducted within the 30-inch Tolerance Zone of these overhead utilities and structures. It is recommended that if work will be completed in the vicinity of non-electric overhead utilities, the overhead utilities should be labeled with warning signs, protective barricades, and/or flags. Non-electrical overhead utilities and structures may include, but is not limited to, pipe chases, water lines, ceilings in buildings, etc. Arcadis field personnel will notify its site workers (employees, subcontractors, vendors, etc.) of known overhead utilities and structures during the tailgate safety meeting. See Exhibit 2 for additional details.

5.8 Reporting Utility Incidents

Arcadis field personnel involved with any strike incidents including contact with a structural feature, subsurface, submerged, and/or aboveground utilities must immediately STOP WORK and contact the Project Manager to discuss the incident. If there are life threatening injuries, or the incident presents a risk to public safety (e.g. natural gas leak, downed live electrical line, flooding, or an unstable building) first call 911 or the available emergency services number for the client site or area and then call the Project Manager. The incident must be reported to Corporate Health and Safety immediately and no later than 24 hours after gaining knowledge of the incident. Compliant notification within 24 hrs. requires an acknowledgement of the notification by Corporate H&S. Team must provide critical details of the incident when notifying Corporate H&S such as; 3rd party involvement, any injuries, known extent of damage and estimate of potential repair cost, service interruption, and client reporting requirements. The project team and field staff will use the Arcadis Utility Line Strike Investigation Form to record initial details of the incident as part of the notification process.

Selected utility strike incidents may also utilize a conference call with operations management to review findings and lessons learned. The Business Line H&S Director will make the determination concerning the need to have the incident investigation review call and will arrange the call, if deemed necessary.

5.9 Relationship of this HSS to the Project Specific HASP

With the exception of the Utility and Structures Checklist, this HSS and the supplement documents, are not required to be printed and attached to project HASPs. Project teams have discretion to include such supplements as a BMP or reference guide when developing a project HASP. During project health and safety planning, this HSS will be reviewed and applicable clearance technologies and methods will be documented on the Utility and Structures Checklist.

Additionally, emergency response procedures specific to utility strikes should be addressed. See ARC HSFS-019 Supplement Section 5 which provides general guidelines for emergency response to utility strikes. Applicable information may be attached to the HASP or the Utility and Structures Checklist to facilitate communication of response expectations.

5.10 Required Contract Terms and Conditions

The Arcadis standard client and subcontractor contracts contain required terms and conditions defining responsibility for utility clearance and the allocation of risk associated with an impacted utility. These terms and conditions have prescribed language concerning subsurface work that is presented in Arcadis client contracts and the Arcadis subcontractor contracts, which can be found on the ANA Intranet Legal webpage. If such provisions cannot be agreed upon, the reasons are documented and other risk-management actions should be identified, such as limits of liability, add additional physical investigations, additional lines of evidence or utility location, assignment of risk to subcontractors, etc. In addition, any changes to these terms and conditions require approval by Legal Services.

6. TRAINING

Employees responsible for coordinating or conducting utility clearance activities will be familiar with the requirements of this HSS and the supplemental documents. Arcadis in-house 8-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) refresher may provide awareness-level training regarding this utility location and clearance HSS.

Field staff must complete a minimum of one year of utility clearance-related experience before accepting responsibility for any utility clearance tasks. This experience requires mentorship by a currently trained and experienced Arcadis employee for the processes of; completing DigSafe 811 notifications, developing a working understanding of the types of utilities present at project sites, developing a working understanding of the various reliable lines of evidence, and participating in on-site training led by another Arcadis employee with detailed knowledge and experience in identifying utilities and structures.

7. REFERENCES

- Occupational Safety and Health Administration (OSHA) 29 CFR Subpart P, Excavations, 1926.651, Specific Excavation Requirements.
  - Common Ground Alliance State Law Directory - https://commongroundalliance.com/map
  - Arcadis Utilities and Structures Checklist:
    - Excel Version - Utility and Structures Checklist
    - PDF Version - Utility and Structures Checklist
  - Arcadis Utility Line Strike Investigation Form
  - The Arcadis ARC HSFS-019 Supplement Documents include the following Sections:
    - Section 1 - Best Practices for Project Managers (or Their Delegates) Concerning Utility Clearance
    - Section 2 - Best Practices for Field Personnel Concerning Utility Clearance
    - Section 3 - Use and Limitations Associated with Location Technologies and Common Utility Clearance Methods
    - Section 4 - Best Practices for State One Call Procedures and Notifications
    - Section 5 - Emergency Action Plan guidelines for Utility Strikes
    - Section 6 - Utility Location SOP for Aquatic Work Activities
  - Figure 1 – 30-Inch Tolerance Zone
  - Arcadis H&S Standard ARC HSCS005 Excavation and Trenching

- Arcadis H&S Standard ARC HSFS0006 Electrical Safety Standard

8. RECORDS

8.1 Utility Clearance Records

All records (maps, checklists, and documentation of communications) used to determine the location of utilities should be retained and kept in the project file.

9. APPROVALS AND HISTORY OF CHANGE

Approved by Julie Santaniello, CSP – Corporate H&S Manager of Technical Programs

History of Change

Revision Date	Revision Number	Standard Developed/Reviewed by or Revised By	Reason for change
13 December 2006	01	Mike Thomas/Pat Vollertsen	Original document
26 March 2007	02	Mike Thomas/Pat Vollertsen	Put in new company format
15 May 2007	03	Mike Thomas/Pat Vollertsen	Added nation-wide 811 number
6 September 2007	04	Mike Thomas/Pat Vollertsen	Changing over to new template format
22 February 2008	05	Mija Coppola	Changing over to new template format
13 January 2009	06	Mija Coppola	Define lines of evidence
4 October 2010	07	Sam Moyers/Mija Coppola	Reformatting and addition of utility clearance information
13 February 2012	08	Sam Moyers/Mija Coppola	Modified link information for utility strike reporting, clarified local/state requirements in section 4.1 and 4.3

Revision Date	Revision Number	Standard Developed/Reviewed by or Revised By	Reason for change
28 January 2013	09	Tony Tremblay	Utility and Structures Checklist revised; hyperlink updated
12 February 2013	10	Amanda Tine/Tony Tremblay	Clarified clearance boundaries for Unqualified staff in Section 5.7 and added information about vehicles and equipment being used near power lines in Section 5.7.1
15 March 2013	11	Kurt Merkle, Rebecca Lindeman / Tony Tremblay	Added additional text to HSS for recent lessons learned, added section 5.4 (Locating Technologies) and 5.5 (Clearance Methodologies), added additional details to section 5.6 when working in close proximity to subsurface utilities, and added Supplement 6 - Utility Location SOP for Aquatic Work Activities.
07 July 2013	12	Andrew McDonald/ Tony Tremblay	Removed HSFS-019 Supplement 1, Utility Definitions. Added hyperlink for One Call and State Law Directory. Segregated evidence of sewer or storm drains in USC list. Removed Sam Moyers and added Andrew McDonald as author.
26 September 2014	13	Andrew McDonald/Tony Tremblay	Added Exhibit 1. Definitions and 30-inch tolerance zone. Clarified use of 811 or state one call as a reliable line of evidence. Added best practice to cover backfilling of pre-cleared boreholes. Updated USC list to cover soft dig termination depths and PM review.
23 February 2015	14	Tony Tremblay	Page number correction

Revision Date	Revision Number	Standard Developed/Reviewed by or Revised By	Reason for change
10 May 2016	15	Denis Balcer/Sharon Lingle/Alec MacAdam/Andrew McDonald/Tony Tremblay/Julie Santaniello	ES and Section 4.2 - define subsurface intrusive work; clarify employees providing oversight of utility contractors, Arcadis requirements of operating and interpreting results of utility clearance equipment, and utility clearance before all subsurface intrusive work. Sections 1 and 5.8- changed submarine to submerged. Section 4.1 – added contacting public utility companies to help clear utilities. Section 4.2 – Clarified requirement to complete one year of utility clearance-related experience. Section 4.2 and 4.3 - Added discussion on aboveground activities causing subsurface disturbances. Added responsibility to clear overhead utilities when heavy equipment will be used and to evaluate use of a spotter. Added that repairs to damaged utilities need to be verified as competent and complete. Section 5.2 – Clarified reliable lines of evidence for each subsurface intrusive work point and degrees of certainty. Added all work within 30-inch Tolerance Zone needs Corp H&S preapproval. Section 5.6 and Exhibit 1- Clarify subsurface intrusive work and activity and exemptions for subsurface intrusive work. Section 5.6.1 – Add requirement to evaluate aboveground activities that may lead to subsurface disturbances that may cause damage to shallow underground utilities or structures.

Revision Date	Revision Number	Standard Developed/Reviewed by or Revised By	Reason for change
10 May 2016	15	Denis Balcer/Sharon Lingle/Alec MacAdam/Andrew McDonald/Tony Tremblay/Julie Santaniello	Section 5.7.2 – added non-electric overhead utilities and structures other than power lines need to be identified and marked if working in that area. Section 9 – Changed reviewer from Tony Tremblay to Julie Santaniello. Exhibit 1 – added definitions of Utility Strike, Daylighting, Potholing, Subsurface Intrusive Work, Subsurface Intrusive Activities, and Utility Bank. HSS and Supplements placed on new Arcadis headers. Updated Supplement revision numbers to be consistent with HSS. Supplement 2 revised. Utility Clearance and Structures Checklist and Utility Strike Investigation Form revised.
17 March 2017	16	Alec MacAdam/Julie Santaniello	Hyperlink updates; minor formatting; Utility Clearance and Structures Checklist revised.
13 May 2020	17	Alec MacAdam/Denis Balcer/Greg Mason/Julie Santaniello	Updated HSS format. Combined HSS Supplements, revised HSS sections, revised the Utility & Structures Checklist, added Exhibit 2 - Acronyms and Abbreviations.

EXHIBIT 1 - Definitions

Aboveground Utilities - For the purpose of this procedure, aboveground utilities include, but are not limited to: any aboveground line, pipe, conduit, system, or facility used for producing, storing, conveying, transmitting or distributing communication or telecommunications signals, electricity, gas, liquid, petroleum and petroleum products, coal slurry, hazardous liquids or gases, water under pressure, steam, sanitary sewage, storm water, or other materials, liquids, or gases.

Daylighting – exposing underground utilities or structures through soft dig technology/clearance prior to completing subsurface intrusive activities.

e.g. - Exempli gratia. Latin for “for the sake of example.” Use it to introduce one or more examples.

Excavation - Any man-made cut, cavity, trench, or depression, in an earth surface formed by earth removal into which a person can bodily enter.

I.e. - I.e. is the abbreviation for “id est” and means “in other words” or “in essence”.

Kilovolt (kV) - One kilovolt is equal to 1,000 volts (v), which are the potential difference that would move one ampere of current against one ohm of resistance. The kilovolt is a multiple of the volt, which is the SI derived unit for voltage.

Overhead Utilities and Structures – Overhead water lines, overhead pipe chases, ceilings in buildings.

Potholing – exposing underground utilities or structures through soft dig technology/clearance prior to completing subsurface intrusive activities.

Subsurface Intrusive Activities – For the purposes of this procedure, subsurface intrusive activities include, but are not limited to excavations, vertical drilling, installing grounding rod, soil sampling, etc.,

Subsurface Intrusive Work – Is any work or activity that breaks the plane of the ground surface. Exemptions include soil sampling using a non-conductive sampling tool to a depth of 6 inches below ground surface (bgs), placement of survey flagging to a depth of 6 inches bgs, and placement of non-conductive survey stake(s) to a depth of 6 inches bgs).

Subsurface Utilities - For the purposes of this procedure, subsurface utilities include, but are not limited to: any underground line, pipe, conduit, system, or facility used for producing, storing, conveying, transmitting or distributing communication or telecommunications signals, electricity, gas, liquid, petroleum and petroleum products, coal slurry, hazardous liquids or gases, water under pressure, steam, storm water, or sanitary sewage; underground storage tanks; tunnels and cisterns; and septic tanks and lines.

Utility Bank – a structure containing two or more conduits. A conduit is a single enclosure containing one or more facilities.

Utility Strike – An unplanned contact of a utility (i.e., overhead utilities, buildings, structures, aboveground utilities, underground utilities. or submerged utilities) during the course of work that results in; damage requiring repairs, making a report to the utility owner, or requiring further assessment to evaluate the potential for damage.

Utility Tolerance Zone – The area within 30 inches measured radially (e.g. extending in all directions) from the outside diameter of a located/marked utility in which special care is to be taken. If the centerline of the utility is marked, the diameter of the utility or utility bank/trench must be incorporated into the 30 inches. This area must be hand cleared with non-mechanized equipment. Once the utility has been exposed, if mechanized equipment is planned for use within the Arcadis 30-inch Tolerance Zone of the utility, such activity must receive pre-approval by Corporate H&S, to mitigate or accept the risk associated with the planned work. See Figure 1 – 30-inch Tolerance Zone.

Exhibit 2 – Acronyms and Abbreviations

ANA	Arcadis North America
Arcadis	Arcadis U.S. Inc.
ARC	Arcadis
APM	Associate Project Manager
APL	Acoustic Pipe Location
AKA	Also Known As
BGS	Below Ground Surface
cm	Centimeter
EM	Electromagnetic
ft.	Feet
GPR	Ground Penetrating Radar
HS	Health and Safety
H&S	Health and Safety
HSS	Health and Safety Standard
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSFS	Health and Safety Field Safety
HSCS	Health and Safety Construction Safety
https	Hypertext transfer protocol secure
in.	Inch
kV	Kilovolt
m	Meter
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PIV	Post Indicator Valve
PUL	Private Utility Locator
PM	Project Manager
RF	Radio Frequency

RFD	Radio Frequency Detection
SOP	Standard Operating Procedure
TM	Task Manager
TZ	Tolerance Zone
UXO	Unexploded Ordinance

Exhibit 2 Figure 1 – Arcadis Tolerance Zone Illustration

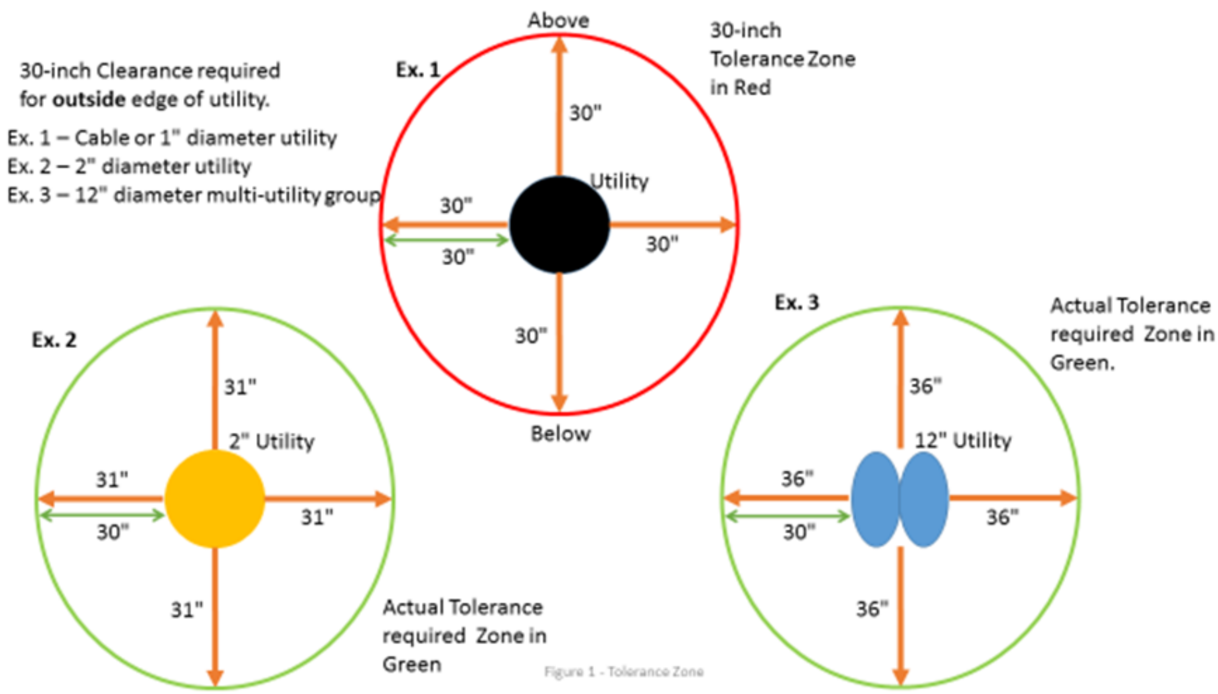
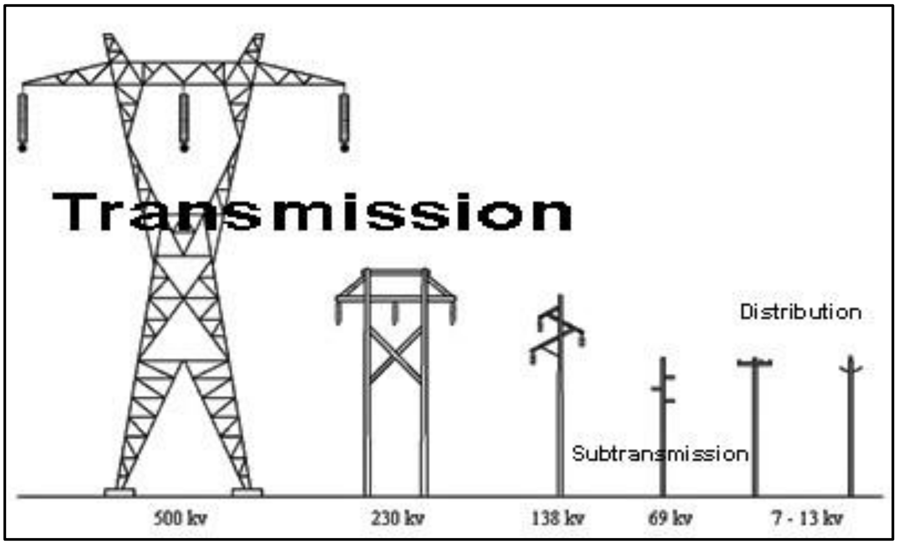
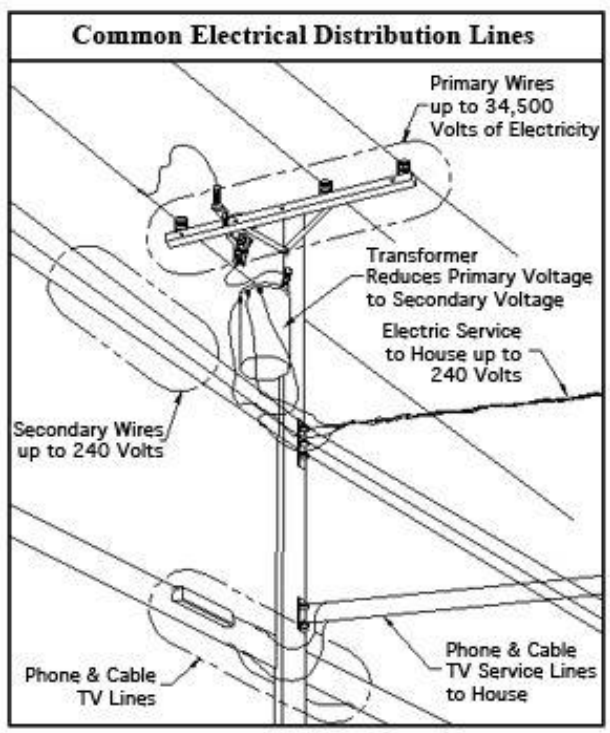


Exhibit 3 – Overhead Power Utility Illustrations





QP 3.07 – Calibration and Control of Measuring and Test Equipment

Rev: 2

Rev Date: April 23, 2024

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	November 8, 2016	All	QP Issued	QMS
	1	October 20, 2021	All	Updated for QMS Relaunch October 12, 2021	Thomas Darby
	2	April 23, 2024	All	Review Completed by SME. Document revision date and revision number update to reflect the review and approval date by SME.	Michael Rossi

Approval Signatures

Prepared by:	**Thomas Darby**	10/20/2021
	Thomas Darby, Preparer	Date
Quality Reviewer:		4/23/2024
	Michael Rossi, Quality Reviewer	Date
QMS Approver:	Marie Lawton	4/23/2024
	Marie Lawton, QMS Director	Date

STATEMENT OF POLICY:

The Arcadis Environment Business Line (ENV) uses measuring and test equipment in the course of its activities. Equipment used by ENV and their subcontractors must be in the condition required for the performance of specified activities. A procedure for performing and documenting calibration and for the preventive maintenance of measuring and test equipment will be followed to provide necessary controls.

1 Purpose

The objective of this Quality Procedure (QP) is to provide a standard procedure for the calibration and control of measuring and test equipment, including establishing the correct equipment type, range, accuracy, and precision to meet data collection needs. Equipment must be uniquely identified, calibrated against recognized standards that are clearly identified and documented, and maintained to provide reliable performance and to meet ENV quality requirements.

2 Responsibilities

Certified Project Manager – responsible for implementation of this procedure.

Field Supervisor – is responsible for field equipment and for communicating calibration and maintenance procedures for equipment used by ENV staff. Similar requirements for field equipment calibration and maintenance should also be communicated to subcontractors using field equipment. Subcontractors are responsible for following those requirements and are subject to performance audits.

Quality Consultant – is responsible for providing quality assurance and quality control guidance to the CPM in implementing this procedure.

Quality Reviewer – is responsible for final review of this Quality Procedure (QP). Quality Reviewers may be a Quality Consultant, QMS Document Owner, Technical Solution Leader, Community of Practice Leader, or other qualified subject matter expert (SME).

Project Team Members – project team members are responsible for verifying calibration status prior to using the equipment, and for operating equipment by approved procedures, documenting information, and reporting equipment malfunctions.

3 Terms and Conditions

Accuracy – a qualitative evaluation of the agreement between an individual value (or the central tendency of a set of values) and the correct value or the accepted reference value.

Calibration – the process of evaluating and standardizing an instrument by determining the deviation from a known standard.

Measuring and Test Equipment – devices or systems used to calibrate, measure, gauge, test, or inspect in order to acquire data.

Precision – a qualitative evaluation of measurement data used to describe the dispersion of a set of numbers with respect to its central tendency.

4 Related Documents

Not Applicable.

5 Description of the Procedure

Measuring and test equipment will be controlled by a calibration and preventive maintenance program. Instruments that measure a quantity or whose performance must meet stated criteria will be subject to calibration. Calibration of equipment may be performed internally using reference equipment and standards, or externally by agencies or manufacturers. Two types of calibration are presented in this procedure:

- Operational calibration, which is routinely performed as part of instrument usage.
- Periodic calibration, which is performed at prescribed intervals for equipment such as water-level indicators, pressure recording devices, and thermometers. In general, equipment that can be calibrated periodically is relatively stable in performance.

Preventive maintenance is an organized and documented program of equipment cleaning, lubricating, reconditioning, adjusting, and/or testing intended to maintain proper performance, prevent equipment from failing during use, and maintain reliability.

1. Calibration Procedures

Documented procedures must be used for calibrating measuring and test equipment and reference equipment. Procedures such as those published by ASTM International (formerly known as the American Society for Testing and Materials), U.S. Environmental Protection Agency (USEPA), or procedures provided by manufacturers will be used whenever possible.

Where pre-established procedures are not available, procedures will be developed. Factors such as the type of equipment, stability characteristics of the equipment, required accuracy and precision, and the effect of error on the quantities measured must be considered. Calibration procedures must include:

- Type of equipment to be calibrated.
- Reference equipment and standards to be used.
- Calibration method and specific procedure.
- Acceptance tolerances.
- Frequency of calibration.
- Data recording form.

2. Equipment Identification

Measuring and test equipment owned by Arcadis must be uniquely identified using the manufacturer's serial number, a calibration system identification number, or an inventory control tag number. This identification must be attached to the equipment. In addition to the identification number, equipment requiring periodic calibration must bear a label indicating when the next calibration is due. Equipment that is rented or leased for the purposes of measuring and testing must also be uniquely identified.

Personnel are responsible for verifying calibration status from due date labels or instrument records prior to using the equipment. Measuring and test equipment that is not properly calibrated must not be used.

3. Calibration Frequency

Measuring and test equipment and reference equipment will be calibrated at prescribed intervals and/or as part of operational use. The calibration frequency will depend on the type of equipment, inherent stability, manufacturer's recommendations, intended use, effect of error on the measurement process, and experience. Calibration frequencies may be defined in project-specific plans or in calibration procedures. The CPM or Field Supervisor is responsible for specifying the procedures to be followed to meet project data quality objectives.

Scheduled periodic calibration may not be performed for infrequently used equipment; such equipment will be calibrated on an "as needed" basis prior to use, and then at the required frequencies for the duration of its use.

Field equipment will require an operational check per the applicable procedure and or the equipment manual prior to use, and then again at the end of the working day. Pre-use calibration should be completed under conditions of anticipated use (e.g., temperature, humidity, and atmospheric pressure) if these parameters may influence results.

4. Reference Equipment and Standards

Whenever possible, equipment must be calibrated using reference equipment (i.e., physical standards) and chemical and radioactive standards having known relationships to nationally recognized standards (e.g., National Institute of Standards and Technology [NIST]) or accepted values of natural physical constants. If national standards or constants do not exist, the basis for the calibration must be documented.

Physical standards may include calibration weights, certified thermometers, standard measurement tapes, gauge blocks, and reference gauges. These are generally used for periodic calibrations. Physical standards must be used only for calibration.

Chemical and radioactive standards may include reagents, solvents, and gases. These may be Standard Reference Materials (SRM) provided by NIST or USEPA, or they may be vendor-certified materials traceable to NIST or USEPA SRMs. Chemical and radioactive standards will primarily be used for operational calibrations.

The date of receipt and expiration date must be clearly labeled on the container of each standard. If calibration standards are transferred to additional containers, these containers must be labeled with the name of the standard, the lot number, and the shelf life. Calibration standards that exceed shelf life must not be used and must be discarded.

If equipment is sent to the manufacturer or calibration laboratory for calibration, adequate documentation must be maintained to establish the calibration method, reference standard source, or traceability to recognized standards.

5. Calibration Failure

Equipment failing calibration or becoming inoperable during use will be removed from service and segregated to prevent inadvertent use or tagged to indicate it is out of service. The equipment must be repaired and properly recalibrated; equipment that cannot be repaired will be replaced.

The results of activities involving equipment that has failed recalibration will be evaluated by the CPM. If the results are adversely affected, the findings of the evaluation will be documented, and appropriate personnel will be notified.

Periodic calibration of measuring and test equipment does not replace the user's responsibility for verifying proper function of equipment. If an equipment malfunction is suspected, the device must be tagged or removed from service, and recalibrated. If it fails recalibration, it must be repaired or replaced.

6. Documentation of Calibration

Records must be maintained for each piece of calibrated measuring and test equipment and each piece of reference equipment. The records must indicate that established calibration procedures have been followed, and that the accuracy of reference chemical and radioactive standards has been verified.

Records for periodically calibrated equipment must include the following minimum information:

- Type and identification number of equipment.
- Calibration frequency and acceptance tolerances.
- Calibration dates.
- Name of individual and organization performing the calibration.
- Reference equipment and/or standards used for calibration.
- Calibration data.
- Certificates or statements of calibration provided by manufacturers and external organizations.
- Documentation of calibration acceptance or failure, and of repair of failed equipment.

For equipment requiring calibration, information should be maintained in a project or equipment database regarding the calibration and maintenance history for that equipment. Equipment that does not have a calibration sticker or that has an expired calibration sticker should be tagged inoperable and sent for calibration. The equipment information file should contain periodic calibration files, as well as equipment calibration and maintenance records, calibration data forms, and/or certification of calibration provided by manufacturers or external organizations and notice of equipment calibration failure.

Measuring and test equipment used for field investigations will typically be calibrated as part of operational use. For this equipment, records of the calibrations or checks will be documented as part of the test data (e.g., in the field notebook or on a Field Activity Log). Equipment-specific forms may also be developed. These records should include information similar to that required for periodically calibrated equipment. Documentation related to malfunctioning equipment or equipment that fails calibration should also be included in the individual equipment file.

Calibration files for equipment requiring periodic calibration should be sent with equipment that is transferred to allow a continuously updated record to be maintained. Recalibration of sensitive equipment should be performed following the transfer.

When measuring and test equipment is rented or leased, procurement documents must specify that a current certificate of calibration must accompany the equipment. This certificate must be maintained with the project documentation calibration records.

7. Operational Checks

Certain equipment may require periodic operability tests or checks to verify that operating systems are within the allowed range. These tests are in addition to formal calibration. Like calibrations, these tests will be performed at specified frequencies, or as part of operational use using reference equipment and standards.

If an instrument fails an operability test, and corrective action cannot bring the instrument into tolerance, it must be removed from service and segregated to prevent inadvertent use or tagged to indicate it is out of service.

Such equipment will be repaired and/or recalibrated.

Operability tests will generally be performed in conjunction with data acquisition. Information recorded must include:

- Type and identification number of equipment (e.g., model and serial numbers).
- Test date.
- Name of individual and organization performing the test.
- Reference equipment and standards used.
- Test data.
- Documentation of acceptance or failure.

Documentation may be in the field notebook or on a Field Activity Log.

8. Preventive Maintenance

Preventive maintenance is an organized program of equipment cleaning, lubricating, reconditioning, adjusting, and/or testing intended to maintain proper performance, prevent equipment from failing during use, and maintain reliability. Specific maintenance details may be supplied in project-specific plans. A typical preventive maintenance program includes:

- A listing of the equipment that is included in the program.
- The frequency of maintenance (manufacturer's recommendations or previous experience with the equipment).
- Service contracts.
- Identification of spare parts.
- Items to be checked and specific protocols to be followed.
- Documentation of maintenance.

Maintenance records of measuring and test equipment must be maintained at the location that is the host for the equipment. Documentation of subcontractor and Arcadis equipment that is used for an individual project will be included in the project files. Records for multi-project equipment will be maintained by the location that controls the equipment.

Measuring and test equipment must be controlled through the use of sign-out/sign-in records or other suitable method. Equipment that is returned from field use must be free of contamination, packaged in a manner suitable for storage, and returned to its designated area. Support personnel should be notified of performance problems with equipment.[Click to enter text]

- END OF PROCEDURE -

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QP 3.08 – Field Sampling, Measurement, and Observations

Rev: 2

Rev Date: December 2, 2022

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	November 3, 2016	All	QP Issued	QMS
	1	October 11, 2021	All	Updated for QMS Relaunch October 12, 2021	Marc Killingstad David Gerber
	2	December 2, 2022	All	Content reviewed by Quality Reviewer. No updates needed at this time.	Marc Killingstad
			All	Updated document Revision No. and Revision Date on all pages. Changed “Arcadis Environmental Business Line (ENV)” to “Resilience Environment (ENV)” First line, Statement of Policy	Rosario Varrella

Approval Signatures

Prepared by:	Marc Killingstad	10/11/2021
	Name (Preparer)	Date
Quality Reviewer:		12/2/2022
	Signature (Quality Reviewer)	Date
QMS Approver:		12/2/2022
	David Gerber)	Date

STATEMENT OF POLICY:

It is the Resilience Environment (ENV) policy that field sampling, measurements, and observations must be conducted and documented to facilitate later data interpretation, provide an evidentiary record and to demonstrate that field activities have been performed consistently and in accordance with approved site-specific project planning documents. Site-specific documents describing field sampling activities may include, but are not limited to, work plans, the Project Quality Plan (PQP), Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), and Technical Guidance Instructions (TGIs), Quality Procedures (QPs), Health and Safety Plan (HASP), and/or other appropriate project documents associated with the sampling program.

1 Purpose

The objective of this Quality Procedure (QP) is to provide a consistent process for the execution of activities associated with field sampling, measurements, and observations. This QP, while focused on field sampling activities, should be performed in conjunction with QP 3.06 Field Activities Documentation.

2 Responsibilities

Certified Project Manager (CPM) – is responsible for implementation of this QP, including verification that site-specific project planning documents are followed (including approved deviation decisions, if necessary). Although a Field Supervisor may lead the sampling activities, the CPM is ultimately responsible for staff's adherence to this QP.

Quality Consultant – responsible for providing quality assurance and quality control (QA/QC) guidance to the CPM in implementing this procedure. Note that for Federal projects there are specific requirements for the QA officer assigned to a project.

Quality Reviewer – Is responsible for final review of this Quality Procedure (QP). Quality Reviewers may be a Quality Consultant, QMS Document Owner, Technical Solution Leader, Community of Practice Leader, or other qualified subject matter expert (SME).

Project Team Members – project participants who are involved in sampling activities are responsible for compliance with this procedure. Individuals involved in the sampling program will read and adhere to the site-specific project planning documents that direct their field activities.

3 Terms and Conditions

Work Plan – a document that describes proposed project activities.

Quality Assurance Project Plan (QAPP) – a document that prescribes the quality assurance/quality control procedures to be followed. Uniform Federal Policy (UFP)-QAPPs are now frequently required for environmental projects by most federal regulatory agencies. UFP-QAPP includes Worksheets used to document the entire project plan developed following the systematic planning process. For more details on the UFP-QAPP see: http://www.epa.gov/fedfac/documents/qualityassurance.htm. Note that if the project QAPP is written following the Uniform Federal Policy (UFP) that it will also contain a description of the sampling rationale and sampling locations as well as quality assurance/quality control requirements. The UFP-QAPP format is designed to capture the entire systematic planning process. If a UFP-QAPP is written for a project, a separate FSP may not be required unless specified by the particular regulatory agency, client or contract.

Field Sampling Plan (FSP) – a document that describes the procedures and protocols necessary to complete field sampling and data collection activities.

Health and Safety Plan (HASP) – a document that describes the hazards of planned activities and the controls to be implemented to protect site personnel.

Data Quality Objective (DQO) – a statement that specifies the quality of data required to support the purposes and intent of the sampling and analysis activity. DQOs are based on the intended use of the data; as such, different data uses and needs may require different levels of data quality.

Technical Guidance Instruction (TGI) –TGIs may also be created or revised on a program or project specific basis. An TGI library is available on the Environment Quality Management System SharePoint site.

4 Related Documents

- QP 3.06 - Field Activities Documentation
- QP 3.07 - Calibration and Control of Measuring and Test Equipment.

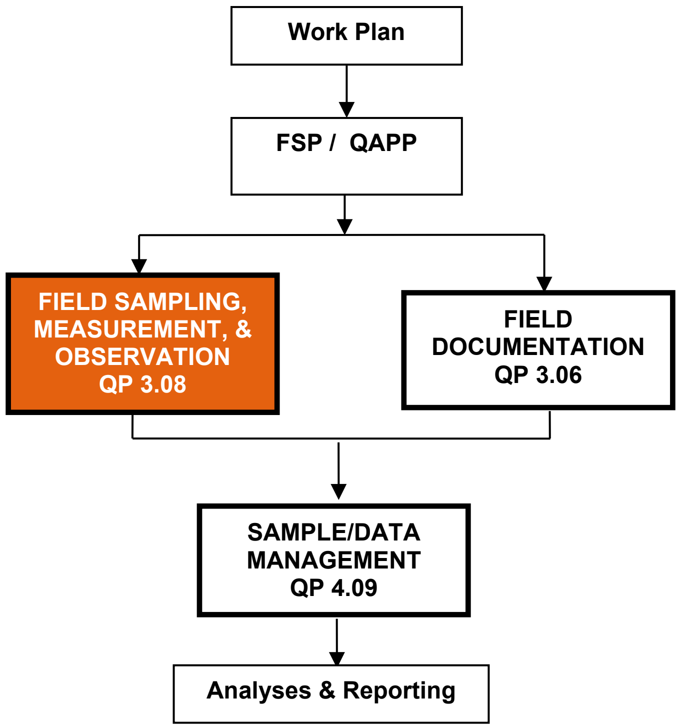
Forms such as purge logs, soil boring logs appropriate for the field sampling activity and observations.

Related documents are available in the QMS Document Library.

5 Description of the Procedure

Sampling and data quality directly affect overall project success because sampling and other field activities are a critical and fundamental component of projects. Errors, mistakes, missed communications, or out-of-scope or out-of-compliance actions may have an adverse effect on a project. Because field conditions cannot be anticipated absolutely, procedures for a particular sampling program must include a formal process for making decisions and obtaining appropriate approvals for deviations necessitated by conditions. Within this context, the basic procedures and requirements for sampling and other field measurements and observations are outlined in the project documents (FSP, QAAP or Work Plan) and the associated procedures. Sample collection, data collection, and drilling locations should be documented (i.e., tape measurements with respect to site features, GPS measurements, and or survey by a licensed land surveyor). It is also recommended taking to the field site maps showing pre-existing and proposed sampling, drilling, data collection, and well locations. It is also recommended the field staff be aware of previous data measurements so field staff can note and communicate any significant changes.

The following flow chart provides the major components of a typical field characterization program and highlights where field sampling activities fit in.



1. Field Sampling, Measurement, and Observation Activities

Field operations are conducted to provide reliable information, data, and/or samples that meet the project and data quality objectives. It is essential that field sampling, measurement, and observation activities begin with the field team having a detailed familiarity with appropriate site-specific project planning documents, most notably the FSP. Time should be scheduled and budgeted for the field team members to review the plan(s) and ask questions. With a good understanding of what samples or data are to be collected, as well as where and why they are to be collected, field personnel will perform the following activities during the implementation of field characterization activities.

1.1 Briefing and Preparation

Before field activity begins, a kick-off meeting should be held to ensure that the project team understands the project objectives and the procedures that will be followed. The CPM and appropriate project office (including relevant technical lead(s)) and field personnel (e.g., Field Supervisor, Crew Leader, or entire crew) should engage in a briefing via telephone discussion or in person to review (in summary fashion) the following:

- Project objectives and project plans
- DQOs
- Sampling locations
- Applicable TGIs for the proposed activities
- Chain of command
- HASP (including site-specific Health and Safety concerns)
- Provisions for addressing deviations
- Communication plan

- Other special circumstances or information critical to the success of the sampling event and integrity of the data and documentation.

When possible, the CPM and/or Field Supervisor should perform a reconnaissance site visit prior to initiation of the sampling or other field activities to review sample locations and consider health and safety or other logistical challenges the site may present. The CPM must also ensure that any utility clearance requirements have been met. Finally, the CPM and/or Field Supervisor must verify that the necessary subcontracts, notifications, and approvals are in place, including coordination with client personnel, agency oversight personnel, access to private or public property (i.e., legal), and coordination with utility companies/agencies regarding the potential of buried, overhead, or other sensitive infrastructure that may affect project implementation and/or health and safety.

1.2 Standard Operating Procedures and Technical Guidance Instructions

Applicable TGIs must be followed to ensure consistency and quality in method and resulting data. A TGI library is available in the Environment Quality Management System SharePoint site. TGIs may also be created or revised on a program or project specific basis. Deviation from established procedure(s) during a data collection activity must be documented. Where plans and TGIs allow discretion (do A or B) or choice (exact sampling location) these decisions should be documented in the field notebook. In cases where the integrity of the data being collected may be jeopardized, field personnel must consider stopping associated work activities until the CPM or other project authority can be consulted as to what corrective action is warranted before work can recommence. Follow the hierarchy of regulatory, client, ENV in selecting and modifying methods and procedures.

1.3 Equipment and Instrumentation

The site-specific project planning documents will be reviewed to identify the types of equipment, instrumentation, and supplies that are needed for the sampling, measurement, observation, or other data collection activities. The selected equipment and instrumentation will meet the requirements of the specifications, methods, and procedures provided in the FSP, QAPP, HASP, or other planning document(s). Further, the Field Supervisor/Crew Leader is responsible for verifying that the equipment and instrumentation are in good working order, clean and, if necessary, properly calibrated and maintained before, during, and after use in the field. (See QP 3.07 Calibration and Control of Measuring and Test Equipment).

1.4 Physical Sample Management

It is extremely important that proper procedures be followed in the sample identification system employed for collected samples, the chain-of-custody procedures, and the manner in which the samples are tracked from collection point, through handling and shipment, and to receipt by the laboratory (including sampling techniques, sample volumes, holding times, preservation, packaging, and shipping procedures). Field personnel are responsible for obtaining the proper number and type of quality control samples, including but not necessarily limited to trip blanks, duplicates, matrix spikes, matrix spike duplicates, and equipment rinse blanks (these requirements should be specified in the site-specific project planning documents and reviewed prior to commencing the field program). These procedures are specified in the Work Plans, FSP, QAPP, and or HASP, or other project planning documents and shall be reviewed by field personnel prior to initiation of field activities. Deviation from established procedures could impact the integrity of the sample or activity; and must be justified, approved by the CPM, and be appropriately documented.

1.5 Qualitative Data Management

Based on requirements specified in site-specific project planning documents, field activities should adhere to applicable TGIs and be carried out in a consistent manner that is well documented in accordance with QP 3.06 Field Activities Documentation. This includes care in making and recording accurate and precise measurements and observations in a timely manner.

1.6 Decontamination and Investigation-Derived Waste

Field personnel will review and be familiar with required decontamination procedures, including those for cleaning field equipment, proper storage of cleaned field equipment, and for properly disposing of waste generated from decontamination procedures. If decontamination is conducted on site, the activities will be performed in a designated, controlled location that will not impact collected samples. Decontamination activities will be appropriately documented in the field notes, following the protocols specified in the FSP/QAPP or TGI and QP 3.06 Field Activities Documentation.

It is important to note that decontamination includes personal protective equipment as well as vehicles and equipment. It is critical that equipment used in one area not serve as a source of contamination of another. This may include weeds or affected soil/water (e.g., carried-in tires or equipment) that could be transported outside the designated work area. Work in surface waters potentially supporting amphibians and other ecological resources may require specific decontamination procedures between sampling events even if no pollutants are anticipated in the waters.

Field personnel will review and be familiar with required procedures for management of investigation-derived waste (IDW) generated as part of the proposed field activities including information/protocols for tracking, storing, labeling, inspecting, sampling, and shipping/disposing of all IDW generated from the proposed field activities. Wastes generated in the field will be collected, stored, and properly disposed in accordance with FSP/QAPP protocols.

1.7 Corrective Action

The CPM and field personnel will be familiar with site-specific project planning procedures designed to address deficiencies or deviations quickly and efficiently, so as not to unnecessarily hold up progress or compromise the integrity of the field effort. Based on the procedures established in the site-specific project planning documents, specific steps are taken as soon as a potential problem is identified. At a minimum, deficiencies or deviations must be reported to the CPM (through pre-established chain of command) and then fully documented to include the nature of the problem, the corrective action taken, and the person(s) responsible for correcting or otherwise addressing the problem. Site-specific project planning documents should contain site-specific corrective action procedures.

- END OF PROCEDURE -

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TGI – Soil Description

Rev: 5

Rev Date: June 20, 2024

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	May 20, 2008	17	Original SOP	Joe Quinnan Joel Hunt
	1	September 2016	15	Updated to TGI	Nick Welty Patrick Curry
	2	February 16, 2018	15	Updated descriptions, attachments and references in text	Nick Welty Patrick Curry
	3	April 15, 2022		Minor description edits, intro of grain-size K analysis, revised boring log template	Matt McCaughey Patrick Curry
	4	June 5, 2023	All	Annual review completed by SME.	Patrick Curry
	5	June 20, 2024	All	Annual review completed/approved by Patrick Curry	Patrick Curry

Approval Signatures

Prepared by: 6/20/2024

Matthew C. McCaughey, PG (Preparer) Date

Reviewed by: 6/20/2024

Patrick Curry, PG (Subject Matter Expert) Date

1 Introduction

This Arcadis Technical Guidance Instruction (TGI) describes proper soil description procedures based on visual inspection and testing of soil cores and samples. This document has been developed to emphasize field observation and documentation of details required to:

- Make hydrostratigraphic interpretations guided by depositional environment/geologic settings
- Provide information needed to understand the distribution of constituents of concern; properly design wells, piezometers, and/or additional field investigations; and develop appropriate remedial strategies.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

This TGI should be followed for unconsolidated material unless there is an established client-required specific procedure or regulatory-required specific procedure. In cases where there is a required specific procedure, it should be followed and should be referenced and/or provided as an appendix to reports that include soil classifications and/or boring logs. When following a required non-Arcadis procedure, additional information required by this TGI should be included in field notes with client approval.

This TGI incorporates elements from various standard systems such as ASTM D2488-06, Unified Soil Classification System, Burmister and Udden Wentworth. However, none of these standard systems focus specifically on contaminant hydrogeology and remedial design. Therefore, although each of these systems contain valuable guidance and information related to correct descriptions, strict application of these systems can omit information critical to our clients and the projects that we perform.

This TGI includes the following attachments:

- **Attachment A –** Field Soil Description Guide
- **Attachment B –** Particle Size System Comparison
- **Attachment C –** Description of Logging Terms
- **Attachment D –** Blank Boring Log
- **Attachment E –** Completed Boring Log

This TGI does not address details of health and safety; drilling method selection; boring log preparation; sample collection; or laboratory analysis. Refer to other Arcadis procedure, guidance, and instructional documents, the project work plans including the quality assurance project plan, sampling plan, and health and safety plan (HASP), as appropriate.

4 Personnel Qualifications

Soil descriptions should only be performed by Arcadis personnel or authorized sub-contractors with a degree in geology or a geology-related discipline. Field personnel will complete training on the Arcadis soil description TGI in the office and/or in the field under the guidance of an experienced field geologist with at least 2 years of prior experience applying the Arcadis soil description method.

5 Equipment List

The following equipment should be taken to the field to facilitate soil descriptions:

- Field book, field forms or digital devices to record soil descriptions
- Field book for supplemental notes
- This TGI for Soil Descriptions and any project-specific procedure, guidance, and/or instructional documents (if required)
- Field card showing Wentworth scale
- Munsell® soil color chart
- Tape measure divided into tenths of a foot
- Stainless steel knife or spatula
- Hand lens
- Water squirt bottle
- 4-ounce glass jars with lids (for collecting soil core samples)
- Personal protective equipment (PPE), as required by the HASP
- Digital camera

- Folding table

6 Cautions

Drilling and drilling-related hazards including subsurface utilities are discussed in other procedure documents and site-specific HASPs and are not discussed herein.

Soil samples may contain hazardous substances that can result in exposure to persons describing soils. Routes for exposure may include dermal contact, inhalation and ingestion. Refer to the project specific HASP for guidance in these situations.

7 Health and Safety Considerations

Field activities associated with soil sampling and description will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities. Know what hazardous substances may be present in the soil and understand their hazards. Always avoid the temptation to touch soils with bare hands, detect odors by placing soils close to your nose, or tasting soils.

8 Procedure

8.1 General Procedures

- Select the appropriate sampling method to obtain representative samples in accordance with the selected sub-surface exploration method, e.g., split-spoon or Shelby sample for hollow-stem drilling, acetate sleeves for direct push, bagged core for sonic drilling, etc.
- Proceed with field activities in required sequence. Although completion of soil descriptions is often not the first activity after opening sampler, identification of stratigraphic changes is often necessary to select appropriate intervals for field screening and/or selection of laboratory samples.
- Set up boring log field sheet.
  - Determine the proper units of measure. Drillers in both the US and Canada generally work in feet due to equipment specifications. Field geologists typically record drilling depths, core recovery, and sample intervals in feet and grain size in millimeters
  - Use the Arcadis standard boring log form (**Attachment D**). *Note that as of April 2022, several digital logging applications are available through the FieldNow™ program and the Fulcrum app. A future revision of this TGI, likely in early 2023, will emphasize digital logging methods and field boring log forms will no longer be acceptable. FieldNow is discussed further in Section 10.*
  - The boring log template includes a graphic log of the primary soil texture to support quick visual evaluation of grain size. The purpose of the graphic log is to quickly assess relative soil permeability. Note, for poorly sorted soils (e.g., glacial till), the principal component may not correlate to permeability of the sample. In this case, the geologist should use best judgement to graph overall soil type consistent with relative soil permeability. For example, for a dense sand/silt/clay till, the graphic log would reflect the silt/clay, rather than sand.

- Record depths along the left-hand side at a standard scale to aid in the use of this tool.
- Examine each soil core (this is different than examining each sample selected for laboratory analysis) and record the soil conditions in accordance with guidelines provided in Section 8.2.
- At the end of the boring, record the amount of drilling fluid used (if applicable) and the total depth logged.
- At a minimum, a written or digital boring log should be prepared with the following information:
  - Describe type of surface material (asphalt, grass, topsoil, gravel, etc.)
  - Describe the type of fill or non-native soils and estimated depth to native soils
  - Record sample intervals (soil cores, environmental and/or geotechnical samples)
  - Describe soil conditions in accordance with this TGI
  - Record moisture content and estimated depth to water table or saturated zone
  - Record the total depth and document why drilling was stopped (refusal, target depth achieved, etc.)

8.2 Soil Description Procedures

The standard soil description order is presented below.

- Depth
- PRIMARY TEXTURE
- Principal and Minor Components with Descriptors
  - % Modifiers and grain size fraction
  - Angularity for very coarse sand and larger particles
  - Consistency or Density
  - Plasticity for silt and clay
  - Dilatancy for silt and silt-sand mixtures
- Sorting
- Moisture Content
- Color
- Notes

Depth. To measure and record the depth below ground surface (bgs) of top and bottom of each stratum, the following information should be recorded.

- Measured depth to the top and bottom of sampled interval. Use starting depth of sample based upon measured tool length information and the length of sample interval.
- Length of sample recovered, not including slough (material that has fallen into hole from previous interval), expressed as fraction with length of recovered sample as numerator over length of sampled interval as denominator (e.g., 36/60 for 36 inches recovered from 5-ft [60-inch] sampling interval).
- Thickness of each stratum measured sequentially from the top of recovery to the bottom of recovery.
- Any observations of sample condition or drilling activity that would help identify whether there was loss from the top of the sampling interval, loss from the bottom of the sampling interval, or compression of the sampling interval. Examples: 14/24, gravel in nose of spoon; or 36/60 bottom 12 inches of core empty.

Determination of Components. Obtain a representative sample of soil from a single stratum. If multiple strata are present in a single sample interval, each stratum should be described separately. More specifically, if the sample is from a 2-foot-long split-spoon where strata of coarse sand, fine sand and clay are present, then the resultant description should be of the three individual strata unless a combined description can clearly describe the interbedded nature of the three strata. Example: SAND, fine; with interbedded lenses of Silt and Clay, ranging between 1 and 3 inches thick.

Identify principal component and express volume estimates for minor components on logs using the following standard modifiers.

Modifier	Percent of Total Sample (by volume)
and	36 – 50
some	21 - 35
little	10 - 20
trace	<10

Determination of components is based on using the Udden-Wentworth particle size classification (see below) and measurement of the average grain size diameter. Each size class differs from the next larger class by a constant ratio of ½. Due to visual limitations, the finer classifications of Wentworth's scale cannot be distinguished in the field and the subgroups are not included. Visual determinations in the field should be made carefully by comparing the sample to the Soil Description Field Guide (**Attachment A**) that shows Udden-Wentworth scale or by measuring with a ruler.

The following table summarized the modified Udden-Wentworth Scale for grain size classification. Note that gravel is a size category encompassing the granule, pebble, cobble, and boulder size classes.

Udden-Wentworth Scale (Modified by Arcadis, 2008)				
Size Category	**Size Class**	**Millimeters**	**Inches**	**Standard Sieve #**
Gravel (Cobble)	Boulder	256 – 4096	10.08+	
	Large cobble	128 - 256	5.04 -10.08	
	Small cobble	64 - 128	2.52 – 5.04	
Gravel (Pebble)	Very large pebble	32 – 64	0.16 - 2.52	
	Large pebble	16 – 32	0.63 – 1.26	
	Medium pebble	8 – 16	0.31 – 0.63	
	Small pebble	4 – 8	0.16 – 0.31	No. 5 +
	Granule	2 – 4	0.08 – 0.16	No.5 – No.10

Sand	Very coarse sand	1 -2	0.04 – 0.08	No.10 – No.18
	Coarse sand	½ - 1	0.02 – 0.04	No.18 - No.35
	Medium sand	¼ - ½	0.01 – 0.02	No.35 - No.60
	Fine sand	1/8 -¼	0.005 – 0.1	No.60 - No.120
	Very fine sand	1/16 – 1/8	0.002 – 0.005	No. 120 – No. 230
Fines	Silt (subgroups not included)	1/256 – 1/16	0.0002 – 0.002	Not applicable (analyze by pipette or hydrometer)
	Clay (subgroups not included	1/2048 – 1/256	0.00002 – 0.0002	

Identify components as follows. Remove particles greater than very large pebbles (64-mm diameter) from the soil sample. Record the volume estimate of the greater than very large pebbles. Examine the sample fraction of very large pebbles and smaller particles and estimate the volume percentage of the pebbles, granules, sand, silt and clay. Use the jar method, visual method, and/or wash method (Appendix X4 of ASTM D2488) to estimate the volume percentages of each category.

Sieve and hydrometer grain-size analysis can be used to vet the visual description, as well as used to estimate hydraulic conductivity. Lab or field sieve analysis is advisable to characterize the variability and facies trends within each hydrostratigraphic unit. It is recommended that sieve-hydrometer analysis be performed on representative samples from each soil type to estimate the fraction of each grain size category using ASTM D422 Standard Test Method for Particle-Size Analysis of Soils. If desired sieve sizes can be specified to follow the Udden-Wentworth classification (U.S. Standard sieve sizes 6; 12; 20; 40; 70; 140; and 270) to retain pebbles; granules; very coarse sand; coarse sand; medium sand; fine sand; and very fine sand, respectively.

Several empirical formulas provide a reliable means of estimating hydraulic conductivity (K) from grain-size distribution data, provided that the formation does not contain abundant fines that result in cohesive or plastic behavior or include cobble-sized grains (Payne et al. 2008). Grain-size analysis can help bracket the permeability of hydrostratigraphic units (HSUs) and identify order-of-magnitude spatial variations in K. Arcadis has completed modifications to the Excel-based program HydroGeoSieveXL (Devlin 2015) to process sieve data quickly and estimate K. The tool calculates estimated K values from grain-size data using 15 different empirical formulas. A decision matrix then selects which of the formulas is relevant for the soil type and calculates an average K.

Principal Component. The principal component is the size fraction or range of size fractions containing the majority of the volume. Examples: the principal component in a sample that contained 55% small to medium pebbles would be “PEBBLES, small to medium”; or the principal component in a sample that was 20% fine sand, 30% medium sand and 25% coarse sand would be “SAND, fine to coarse” or for a sample that was 40% silt and 45% clay the principal component would be “CLAY and SILT”.

The boring log form (**Appendix D**) includes a graphic log to visually illustrate a relative estimate of soil permeability. To use the graphic log, place an ‘X’ or shade the appropriate column for the primary soil texture. If the soils have a high percentage of a secondary soil texture (i.e., when the ‘and’ modifier’ is used), it’s acceptable to mark off the appropriate column for the secondary soil texture in this instance. However, care should be used to avoid marking off the columns for other minor soil textures because doing so will make it difficult to determine the relative soil permeability of the poorly sorted soils.

As noted above, for poorly sorted soils such as glacial till, the principal component may not correlate to permeability of the sample. In this case, the geologist should use best judgement to graph overall soil type consistent with relative soil permeability.

Minor Component(s). The minor component(s) are the size fraction(s) containing less than 50% volume. Example: the identified components are estimated to be 60% medium sand to granules, 25% silt and clay; 15% pebbles – there are two identified minor components: silt and clay; and pebbles.

Include a standard modifier to indicate percentage of minor components (see particle size table) and the same descriptors that would be used for a principal component. An example of minor constituents with modifiers include: some silt and clay, low plasticity; little medium to large pebbles, sub-round.

8.2.1 Secondary Descriptors

The following are the descriptors used outside of the principal and minor components. Note that plasticity should be provided as a descriptor for clay and clay mixtures. Dilatancy should be provided for silt and silt mixtures. Angularity should be provided as a descriptor for pebbles and coarse sand.

Angularity. Describe the angularity for very coarse sand and larger particles in accordance with the table below (ASTM D-2488-06). Figures showing examples of angularity are available in ASTM D-2488-06 and the Arcadis Soil Description Field Guide (**Appendix B**).

Description	Criteria
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
Sub-Angular	Particles are like angular description but have rounded edges
Sub-Rounded	Particles have nearly plane sides but have well-rounded corners and edges
Rounded	Particles have smoothly curved sides and no edges.

Plasticity. Describe the plasticity for silt and clay based on observations made during the following test method (ASTM D-2488-06).

- As in the dilatancy test (described below), select enough material to mold into a ball about ½ inch (12 mm) in diameter. Mold the material, adding water, if necessary, until it has a soft, but not sticky, consistency.
- Shape the test specimen into an elongated pat and roll by hand on a smooth surface or between the palms into a thread about 1/8 inch (3 mm) in diameter. If the sample is too wet to roll easily, it should be spread into a thin layer and allowed to lose some water by evaporation. Fold the sample threads and reroll repeatedly until the thread crumbles at a diameter of about 1/8 inch. The thread will crumble when the soil is near the plastic limit.

Description	Criteria
Non-plastic	A 1/8-inch (3 mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

Dilatancy. Describe the dilatancy for silt and silt-sand mixtures using the following field test method (ASTM D-2488-06).

- From the specimen, select enough material to mold into a ball about ½ inch (12 mm) in diameter. Mold the material adding water, if necessary, until it has a soft, but not sticky, consistency.
- Smooth the ball in the palm of one hand with a small spatula.
- Shake horizontally, striking the side of the hand vigorously with the other hand several times.
- Note the reaction of water appearing on the surface of the soil.
- Squeeze the sample by closing the hand or pinching the soil between the fingers, and not the reaction as none, slow, or rapid in accordance with the table below. The reaction is the speed with which water appears while shaking and disappears while squeezing.

Description	Criteria
None	No visible change in the specimen
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing
Rapid	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing

Note that silt and silt-sand mixtures will be non-plastic and display dilatancy. Clay mixtures will have some degree of plasticity but do not typically react to dilatancy testing. Therefore, the tests outlined above can be used to differentiate between silt-dominated and clay-dominated soils.

Sorting. Sorting is the opposite of grading, which is a commonly used term in the USCS or ASTM methods to describe the uniformity of the particle size distribution in a sample. Well-sorted samples are poorly graded and poorly sorted samples are well graded. Arcadis prefers the use of sorting for particle size distributions and grading to describe particle size distribution trends in the vertical profile of a sample or hydrostratigraphic unit because of the relationship between sorting and the energy of the depositional process. For soils with sand-sized or larger particles, sorting should be determined as follows:

Description	Criteria
Well Sorted	the range of particle sizes is limited (e.g., the sample is comprised of predominantly one or two grain sizes)
Poorly Sorted	A wide range of particle sizes are present

You can also use sieve analysis to estimate sorting from a sedimentological perspective; sorting is the statistical equivalent of standard deviation. Smaller standard deviations correspond to higher degree of sorting (see Remediation Hydraulics, 2008).

Consistency or Density. This can be determined by standard penetration test (SPT) blow counts (ASTM D-1586) obtained when using hollow-stem auger drilling methods and a split spoon sampling device. Otherwise, some field tests are available as outlined below. When drilling with hollow-stem augers and split-spoon sampling, the SPT blow counts and N-value is used to estimate density. The N-value is the blows per foot for the 6” to 18” interval. For example, for a 24-inch split spoon soil core, the recorded blows per 6-inch interval are: 4/6/9/22. Since the second interval is 6” to 12”, the third interval is 12” to 18”, the N value is 6+9, or 15. Fifty blow counts for less than 6 inches is considered refusal. In recent years, more common drilling methods include rotary-sonic or direct push. When blow counts are not available, density is determined using a thumb test. Note however, the thumb test only applies to fine-grained soils.

Fine-grained soil – Consistency

Description	Criteria	Blow Counts (6-12 to 12-18-inch split spoon interval)
Very soft	Easily penetrated several inches by thumb	N-value < 2
Soft	Easily penetrated one inch by thumb	N-value 2-4
Medium Stiff	Indented about ½ inch with much effort	N-value 5-8
Stiff	Indented with ¼ inch with great effort	N-value 9-15
Very Stiff	Readily indented by thumbnail	N-value 16-30
Hard	Indented by thumbnail with difficulty	N-value > than 30

Coarse-grained soil – Density

Description	Criteria	Blow Counts (6-12 to 12-18-inch split spoon interval)
Very loose Loose Medium dense Dense Very dense	Density classification of coarse-grained soils is only required when blow counts from standard penetration tests are performed during hollow-stem auger drilling	N-value 1- 4 N-value 5-10 N-value 11-30 N-value 31- 50 N-value >50

Moisture Content. Moisture content should be described for each soil sample in accordance with the table below (percentages should not be used unless determined in the laboratory). *Note that some drilling methods (e.g., sonic) can compress and dry out the sample during drilling. Therefore, it can be difficult to determine if a sample is saturated, or merely moist. In this case, care should be taken to try and determine a static water level within the borehole by measuring depth to water through the drill casing, if possible.*

Description	Criteria
Dry	Absence of moisture, dry to touch, dusty
Moist	Damp but no visible water
Wet	Visibly free water

Color. Color should be described using simple basic terminology and modifiers based on the Munsell system. Munsell alpha-numeric codes are required for all samples. If the sample contains layers or patches of varying colors this should be noted, and all representative colors should be described. The colors should be described for moist samples. If the sample is dry, it should be wetted prior to comparing the sample to the Munsell chart.

Notes. Additional comments should be made where observed and should be presented as notes with reference to a specific depth interval(s) to which they apply. Some of the significant information that may be observed includes the following.

- Odor - You should not make an effort to smell samples by placing near your nose since this can result in unnecessary exposure to hazardous materials. However, odors should be noted if they are detected during the normal sampling procedures. Odors should be based upon descriptors such as those used in NIOSH “Pocket Guide to Chemical Hazards”, e.g., “pungent” or “sweet” and should not indicate specific chemicals such as “phenol-like” odor or “BTEX” odor.
- Structure
- Bedding planes (laminated, banded, geologic contacts).
- Presence of roots, root holes, organic material, man-made materials, minerals, etc.
- Mineralogy

- Cementation
- NAPL presence/characteristics, including sheen (based on client-specific guidance).
- Reaction with HCl - typically only used for special soil conditions, such as caliche environments.
- Origin, if known (Lacustrine; Fill; etc.).

8.3 Example of Soil Descriptions

The standard generic description order is presented below.

- Depth
- PRIMARY TEXTURE
- Principal and Minor Components with Descriptors
    - % Modifiers and grain size fraction
    - Angularity for very coarse sand and larger particles
    - Consistency or Density
    - Plasticity for silt and clay
    - Dilatancy for silt and silt-sand mixtures
- Sorting
- Moisture Content
- Color
- Notes

10-15 feet CLAY, trace silt, trace small to very large pebbles, subround to subangular up to 2" diameter; medium to high plasticity, stiff, moist, dark grayish brown (10YR 4/2). NOTE: Lacustrine; laminated 0.1 to 0.2" thick, laminations brownish yellow (10YR 4/3).

10 -15 feet SAND, medium to very coarse, little granules to medium pebbles, subround to subangular, trace silt; poorly sorted, wet, grayish brown (10YR5/2).

Unlike the first example where a density of cohesive soils could be estimated, this rotary-sonic sand and pebble sample was disturbed during drilling (due to vibrations in a loose sand and pebble matrix) so no density description could be provided. Neither sample had noticeable odor so odor comments were not included.

9 Waste Management

Project-specific requirements should be identified and followed. The following procedures, or similar waste management procedures are generally required.

Water generated during cleaning procedures will be collected and contained onsite in appropriate containers for future analysis and appropriate disposal. PPE (such as gloves, disposable clothing, and other disposable equipment) resulting from personnel cleaning procedures and soil sampling/handling activities will be placed in plastic bags. These bags will be transferred into appropriately labeled 55-gallon drums or a covered roll-off box for appropriate disposal.

Soil materials will be placed in sealed 55-gallon steel drums or covered roll-off boxes and stored in a secured area. Once full, the material will be analyzed to determine the appropriate disposal method.

10 Data Recording and Management

10.1 Digital Data Collection Process Overview

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

10.2 Digital Data Collection Tools for Soil Descriptions

Arcadis is transitioning from the use of paper forms to a digital soil description logging process using web-based FieldNow applications accessible on field tablets and smart phones. Company-wide roll out of a FieldNow application for soil descriptions is targeted by the end of 2022.

Paper forms are included in Revision 3 (April 2022) of this Soil Description TGI. Specifically, a blank boring log and completed boring log are provided in **Attachment D** and **Attachment E**. Additional guidance and examples of the digital data collection tools for soil descriptions will be provided in the next revision to this TGI.

10.3 Additional Guidance

The general logging scheme for soil descriptions is described in this document. Depending on project data quality objectives, specific soil description parameters that are not applicable to project goals may be omitted at the project manager's discretion. In any case, use of consistent procedures is required.

Completed logs and/or logbook will be maintained in the task/project field records file. Digital photographs of typical soil types observed at the site and any unusual features should be obtained whenever possible. Photographs should include a ruler or common object for scale. Photo location, depth and orientation must be recorded in the daily log or logbook and a label showing this information in the photo is useful.

For projects involving soil logging and soil sampling, the soil sample should be recorded on the Arcadis boring log form and the field logbook based on Data Quality Objectives for the task/project.

11 Quality Assurance

Soil descriptions should be completed only by appropriately trained personnel. Descriptions should be reviewed by an experienced field geologist for content, format and consistency. Edited boring logs should be reviewed by the original author to assure that content has not changed.

12 References

ASTM D-1586, Test Method for Penetration Test and Split-Barrel Sampling of Soils.

ASTM D-2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

ASTM D422, 63rd Edition, 1972 - Standard Test Method for Particle-Size Analysis of Soils.

Devlin, J.F. 2015. HydroGeoSieve XL: an Excel-based tool to estimate hydraulic conductivity from grain-size analysis. Hydrogeology Journal, DOI 10.1007/s10040-015-1255-0.

Folk, Robert L. 1980. Petrology of Sedimentary Rocks, p. 1-48.

Payne, F. C., Quinnan, J. A., & Potter, S. T. 2008. Remediation Hydraulics. Boca Raton: FL: CRC Press.

United States Bureau of Reclamation. Engineering Geology Field Manual. United States Department of Interior, Bureau of Reclamation. http://www.usbr.gov/pmts/geology/fieldmap.htm.

Munsell® Color Chart – available from Forestry Suppliers, Inc.- Item 77341 “Munsell® Color Soil Color Charts.

Field Gauge Card that Shows Udden-Wentworth scale – available from Forestry Suppliers, Inc. – Item 77332 “Sand Grain Sizing Folder.”

NIOSH Pocket Guide to Chemical Hazards.

Attachment A

Soil Field Reference Guide

The purpose of this attachment is to present a field reference guide for use during soil logging. Field staff are encouraged to bring a laminated copy of this reference guide into the job site.

ON THE ORIGINAL DRAWING.
USE TO VERIFY FIGURE
REPRODUCTION SCALE

SOIL DESCRIPTION FIELD GUIDE (APRIL, 2022; REV. 3.0)

ARCADIS Design & Consultancy for natural and built assets

FINE-GRAINED SOILS

Description	Criteria
	Descriptor - Plasticity
Nonplastic	A 1/8-inch (3 mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.
	Descriptor - Dilatancy
No Dilatancy	No visible change when shaken or squeezed.
Slow	Water appears slowly on the surface of soil during shaking and does not disappear or disappears slowly when squeezed.
Rapid	Water appears quickly on surface of soil during shaking and disappears quickly when squeezed.
Minor Components with Descriptors	
	Moisture
Dry	Absence of moisture, dry to touch, dusty.
Moist	Damp but no visible water.
Wet	Visible free water; soil is usually below the water table. (Saturated)
	Consistency
Very soft	N-value < 2 or easily penetrated several inches by thumb.
Soft	N-value 2-4 or easily penetrated 1 inch by thumb.
Medium stiff	N-value 5-8 or indented about 1/2 inch by thumb with great effort.
Stiff	N-value 9-15 or indented about 1/4 inch by thumb with great effort.
Very stiff	N-value 16-30 or readily indented by thumb nail.
Hard	N-value > than 30 or indented by thumbnail with difficulty.
Color using Munsell	
Geologic Origin (if known)	
Other	

EXAMPLE OF SOIL DESCRIPTION AND PHOTO

10-15 feet CLAY, trace silt, trace small to very large pebbles, subround to subangular up to 2" diameter; medium to high plasticity, stiff, moist, dark grayish brown (10YR 4/2). NOTE: Lacustrine; laminated 0.1 to 0.2" thick, laminations brownish yellow (10YR 4/3).

DESCRIPTION ORDER

Depth Interval
PRIMARY TEXTURE (e.g., SAND)
Principal and Minor Components with Descriptors:
- % Modifiers and grain size fraction
- Angularity coarse sand and larger
- Consistency or Density
- Plasticity for silt and clay
- Dilatancy for silt and silt-sand

Sorting for granular sediments
Moisture Content
Color
Other NOTES

MINOR COMPONENTS % MODIFIERS

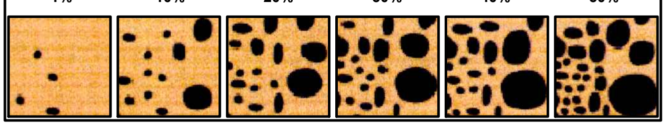
Modifier	Percent of Total Sample (by volume)
and	36 - 50
some	21 - 35
little	10 - 20
trace	<10

UDDEN-WENTWORTH SCALE

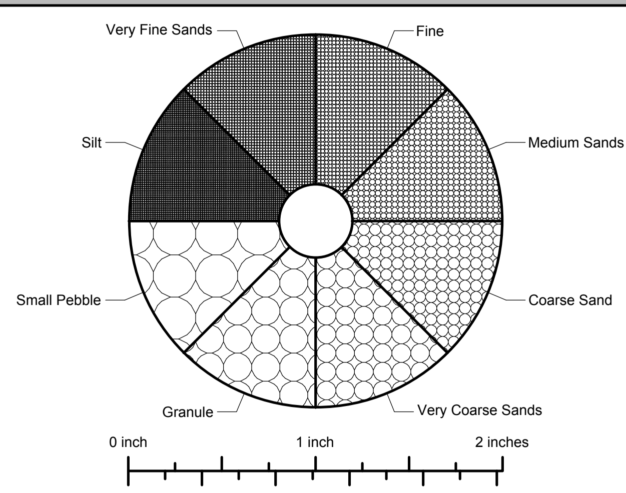
Fraction	Sieve Size	Grain Size	Approximate Scale
Boulder		256 - 4096 mm	Larger than volleyball
Large Cobble		128 - 256 mm	Softball to volleyball
Small Cobble		64 - 128 mm	Pool ball to softball
Very Large Pebble		32 - 64 mm	Pinball to pool ball
Large Pebble		16 - 32 mm	Dime size to pinball
Medium Pebble		8 - 16 mm	Pencil eraser to dime size
Small Pebble	No. 5+	4 - 8 mm	Pea size to pencil eraser
Granule	No. 10 - 5	2 - 4 mm	Rock salt to pea size
Very Coarse Sand	No. 18 - 10	1 - 2 mm	See field gauge card
Coarse Sand	No. 35 -18	0.5 - 1 mm	See field gauge card
Medium Sand	No. 60 - 35	0.25 - 0.5 mm	See field gauge card
Fine Sand	No. 120 - 60	0.125 - 0.25 mm	See field gauge card
Very Fine Sand	No. 230 - 120	0.0625 - 0.125 mm	See field gauge card
Silt and Clay. See SOP for description of fines	Not Applicable	<0.0625 mm	Analyze by pipette or hydrometer

PARTICLE PERCENT COMPOSITION ESTIMATION

1%	10%	20%	30%	40%	50%



GRAPH FOR DETERMINING SIZE OF PARTICLES



FOR COARSE-GRAINED SOILS

Description	Criteria
	Descriptor - Angularity
Angular	Particles have sharp edges and relatively planar sides withunpolished surfaces.
Subangular	Particles are similar to angular but have rounded edges.
Subround	Particles have nearly planar sides but have well-roundedcorners and edges.
Round	Particles have smoothly curved sides and no edges.
Minor Components with Descriptors	
	Sorting Cu= d60/d10
Well Sorted	Near uniform grain-size distribution Cu= 1 to 3.
Poorly Sorted	Wide range of grain size Cu= 4 to 6.
	Moisture
Dry	Absence of moisture, dry to touch, dusty.
Moist	Damp but no visible water.
Wet	Visible free water; soil is usually below the water table. (Saturated)
	Density
Very loose	N-value 1 - 4
Loose	N-value 5 - 10
Medium Dense	N-value 11 - 30
Dense	N-value 31 - 50
Very dense	N-value >50
Color using Munsell	
Geologic Origin (if known)	
Other	
	Cementation
Weak Cementation	Crumbles or breaks with handling or little finger pressure.
Moderate Cementation	Crumbles or breaks with considerable finger pressure.
Strong Cementation	Will not crumble with finger pressure.
	Reaction with Dilute HCl Solution (10%)
No Reaction	No visible reaction.
Weak Reaction	Some reaction, with bubbles forming slowly.
Strong Reaction	Violent reaction, with bubbles forming immediately.

EXAMPLE OF SOIL DESCRIPTION AND PHOTO

10 -15 feet SAND, medium to very coarse, little granules to medium pebbles, subround to subangular, trace silt; poorly sorted, wet, grayish brown (10YR 5/2).

SOIL DESCRIPTION FIELD GUIDE (APRIL, 2022; REV. 3.0)

ARCADIS Design & Consultancy for natural and built assets

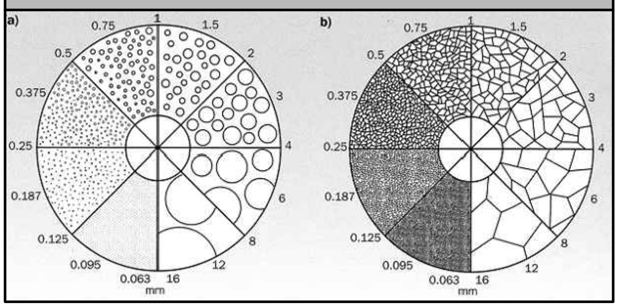
VARIATIONS IN SOIL STRATIGRAPHY

Term	Thickness of Configuration
Parting	0 - to 1/16-inch thickness.
Seam	1/16 - to 1/2-inch thickness.
Layer	1/2 - to 12-inch thickness.
Stratum	> 12-inch thickness.
Pocket	Small erratic deposit, usually less than 1 foot in size.
Varved Clay	Alternating seams or layers of sand, silt, and clay (laminated).
Occasional	≤ 1 foot thick.
Frequent	> 1 foot thick.

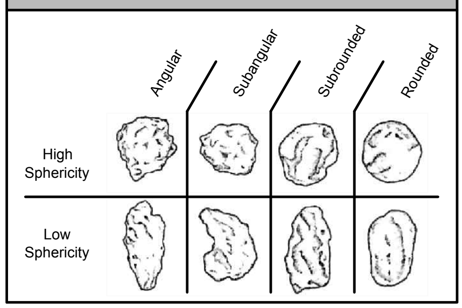
SOIL STRUCTURE DESCRIPTIONS

Term	Description
Homogeneous	Same color and appearance throughout.
Laminated	Alternating layers < 1/4 inch thick.
Stratified	Alternating layers ≥ 1/4 inch thick.
Lensed	Inclusions of small pockets of different materials, such as lenses of sand scattered through a mass of clay; note thickness.
Blocky	Cohesive soil can be broken down into small angular lumps, which resist further breakdown.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear to be polished or glossy, sometimes striated.

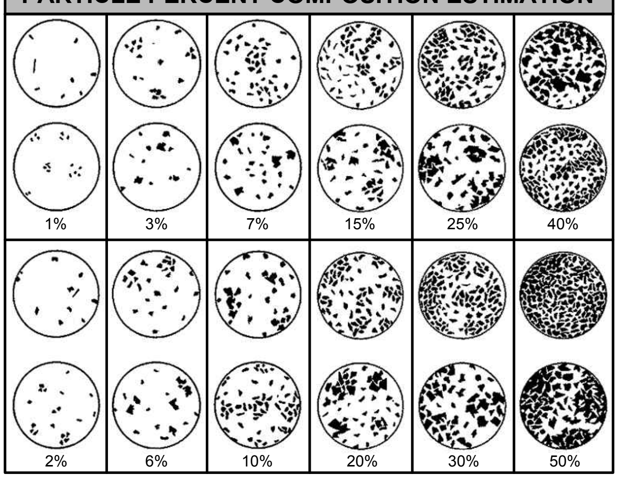
GRAPH FOR DETERMINING SIZE OF PARTICLES



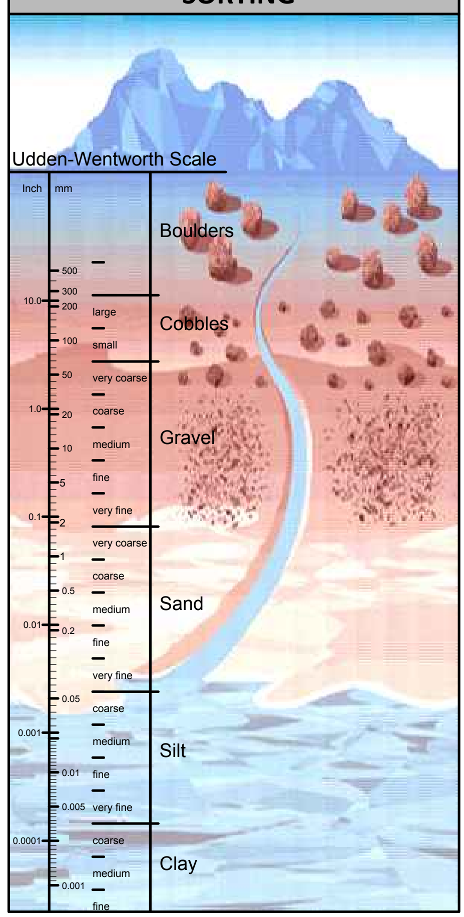
ANGULARITY CHART



PARTICLE PERCENT COMPOSITION ESTIMATION



SORTING



SETTLING TABLE (SILT/CLAY)

Diameter of Particle (mm)	<0.625	<0.031	<0.016	<0.008	<0.004	<0.002	<0.0005
Depth of Withdrawal (cm)	10	10	10	10	5	5	3
Time of Withdrawal	hr:min:sec	hr:min:sec	hr:min:sec	hr:min:sec	hr:min:sec	hr:min:sec	hr:min:sec
Temperature (Celsius)							
20	00:00:29	00:01:55	00:07:40	00:30:40	00:61:19	04:05:00	37:21:00
21	00:00:28	00:01:52	00:07:29	00:29:58	00:59:50	04:00:00	
22	00:00:27	00:01:50	00:07:18	00:29:13	00:58:22	03:54:00	
23	00:00:27	00:01:47	00:07:08	00:28:34	00:57:05	03:48:00	
24	00:00:26	00:01:45	00:06:58	00:27:52	00:55:41	03:43:00	33:56:00
25	00:00:25	00:01:42	00:06:48	00:27:14	00:54:25	03:38:00	
26	00:00:25	00:01:40	00:06:39	00:26:38	00:53:12	03:33:00	
27	00:00:24	00:01:38	00:06:31	00:26:02	00:52:02	03:28:00	
28	00:00:24	00:01:35	00:06:22	00:25:28	00:50:52	03:24:00	31:00:00
29	00:00:23	00:01:33	00:06:13	00:24:53	00:49:42	03:10:00	
30	00:00:23	00:01:31	00:06:06	00:24:22	00:48:42	03:05:00	

10 inches
9 inches
8 inches
7 inches
6 inches
5 inches
4 inches
3 inches
2 inches
1 inch
1/10in

0 mm
10 mm
20 mm
30 mm
40 mm
50 mm
60 mm
70 mm
80 mm
90 mm
100 mm
110 mm
120 mm
130 mm
140 mm
150 mm
160 mm
170 mm
180 mm
190 mm
200 mm
210 mm
220 mm
230 mm
240 mm
250 mm

Attachment B

Particle Size System Comparison

The purpose of this attachment is to illustrate how the Udden-Wentworth particle sizes and descriptive terms compares to other particle size systems.

When in the field, it is a customary practice to compare current soil descriptions to historical soil boring logs for reference purposes. When reviewing boring logs prepared by others, field staff should first note the particle size system used and recognize these particle size systems may differ. This will avoid confusion when cross referencing between historical and new boring logs and when reviewing existing geologic cross-sections.

For example, a well-sorted sand with grain sizes ranging from 1 to 2 mm should be classified as a very coarse sand by the Udden-Wentworth system. As shown in this attachment, the same particle size would be classified as a medium sand by the United Soil Classification System. The later system has fewer particle size grades and in general, is less descriptive than the Udden-Wentworth system.

PARTICLE SIZE SYSTEM COMPARISON

System Name | **Used By** | **Grain size distribution in millimeters (mm)**

Udden-Wentworth — Remediation Geologists and Engineers

								Pebbles				Cobbles	
		V. Fine	Fine	Medium	Coarse	V. Coarse	Granule	Small	Medium	Large	V. Large	Small	Large
CLAY	SILT	SAND					GRAVEL						

0.039 0.065 0.125 0.25 0.5 1 2 4 8 16 32 64 128 256

1/16 1/8 1/4 1/2

United Soil Classification System — Geotechnical Engineers

		Fine	Medium	Coarse	Fine	Coarse	
CLAY	SILT	SAND			GRAVEL		COBBLE

0.074 0.42 2 4.75 19 75 300

U.S. Dept. of Agriculture — Soil Scientists

		V. Fine	Fine	Medium	Coarse	V. Coarse	
CLAY	SILT	SAND					GRAVEL

0.002 0.05 0.10 0.25 0.5 1 2 75

Remediation Hydraulics 2008, page 195): The Udden-Wentworth scale is preferred "...because the geometric progression of grain-size diameter also reflects relationships that are important when considering the erosion and deposition of sediments during the depositional process. The correlation between increasing grain size and degree of sorting and permeability is the most important, as permeability structure is responsible for the mobile and immobile porosity within aquifer systems. "

Attachment C

Description of Soil Logging Terms

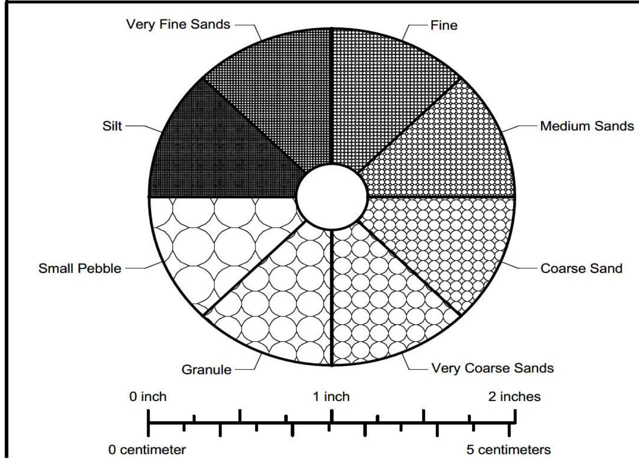
The purpose of this attachment is to concisely define the soil logging terms used when filling out boring logs. During report preparation, project staff could use this sheet as an index placed in front of the completed boring logs. Also, it can serve as a supplemental reference sheet during field activities.

Description of Logging Terms

ARCADIS

Note: Soil descriptions based on Arcadis Technical Guidance and Instructions (TGI) procedures. Key terms defined below.

GRAPH FOR DETERMINING SIZE OF PARTICLES



Udden Wentworth Soil Sizes

Boulder	> 256 mm
Large Cobble	128 to 256 mm
Small Cobble	64 to 128 mm
Very Large Pebble	32 to 64 mm
Large Pebble	16 to 32 mm
Medium Pebble	8 to 16 mm
Small Pebble	4 to 8 mm
Granule	2 to 4 mm
Very Coarse Sand	1 to 2 mm
Coarse Sand	0.5 to 1 mm
Medium Sand	0.25 to 0.5 mm
Fine Sand	0.125 to 0.25 mm
Very Fine Sand	0.062 to 0.12 mm
Silt/Clay	<0.065 mm

Primary Texture *(e.g. CLAY, SILT, SAND, GRANULE, PEAT, MUCK, FILL, etc.)*
List particle size with the highest percentage per sample interval (e.g. SAND)
Always CAPITALIZE the primary texture
Follow primary texture with a comma followed by grain-size descriptors, etc.

Minor Texture

And	(36 to 50%)
Some	(21 to 35%)
Little	(10 to 20%)
Trace	(>10%)

Angularity

Angular	Sharp edges
Sub-Angular	Rounded edges
Sub-Rounded	Well-rounded
Rounded	Smooth curved edges

Sand Density (Blow Counts/ft)

Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	<50

Silt/Clay Consistency (Blow Counts/ft)

Very Soft	0-2,	thumb easily penetrates several inches
Soft	3-4,	thumb easily penetrates one inch
Medium Stiff	5-8,	thumb indents 0.5 in. with much effort
Stiff	9-15,	thumb indents 0.25 in. with great effort
Very Stiff	16-30,	thumbnail is readily intended

Sorting

Well Sorted	1 to 3 Particle Sizes
Poorly Sorted	4+ Particle Sizes

Moisture Content

Dry	Dry to touch
Moist	No visible water
Wet	Visible free water

Plasticity (for silts and clays)

Non-Plastic	3 mm thread can not be rolled
Low Plasticity	3 mm thread can barely be rolled
Medium Plasticity	3 mm thread can easily and quickly rolled, but not rerolled
High Plasticity	3 mm thread can be rolled slowly, but can be rerolled

Dilatancy (for silts and silt-sand mixtures)

None	No visible change in the specimen
Slow	Water appears slowly during shaking / disappears slowly or not at all upon squeezing
Rapid	Water appears quickly during shaking / disappears quickly upon squeezing

Example Description

10 -15 feet SAND, medium to very coarse, little granules to medium pebbles, subround to subangular, trace silt; poorly sorted, wet, grayish brown (10YR5/2).

Attachment D

Blank Boring Log

The purpose of this attachment is to present a blank field form for use during soil logging. A digital version (Microsoft Excel) of this field form is available from the authors (upon request). If project specific modifications to this boring log template are warranted, please contact the Site Investigation Community of Practice leader for further assistance.

BORING LOG

Boring ID:		**Project Name:**		**Page:**	/
Permit ID:		**Date Started:**		**Ground Elevation:**	
Site Address:		**Date Completed:**		**Vertical Datum:**	
City, State:		**Total Depth:**		**Northing:**	
Drilling Co:		**Depth to Water:**		**Easting:**	
Driller:		**Hole Diameter:**		**Horizontal Datum:**	
Drilling Method:		**Core Device:**		**Prepared by:**	
Boring Status:		**Drilling Fluid:**		**Reviewed by:**	

Drilling Information				Graphical Log for Primary Texture											Soil Description (Udden-Wentworth System)	Field Notes
				Fines		Sand					Gravel					
Drilling Depth (ft bgs)	Core Interval (ft)	Core Recovery (inches)	Vapor Reading (ppm)	clay	silt	very fine	fine	medium	coarse	very coarse	granule	pebble	cobble	boulder	Depth Interval (ft), PRIMARY TEXTURE, Principal and Minor Components with Descriptors (% modifiers and grain size fraction, angularity for coarse sand and larger, consistency/density, plasticity for silt and clay, dilatancy for silt/silt-sand); Sorting, Moisture Content, Color. NOTES: *Texture Modifiers: Trace (<10%), Little (10 to 20%), Some (21 to 35%), And (36 to 50%)*	Driller's Observations, Geologic Formation, Field Screening Results, Sample Interval etc.

BORING LOG

Boring ID: ______________________ **Project Name:** ______________________________ **Page:** ______ / ______

Drilling Information				Graphical Log for Primary Texture											Soil Description (Udden-Wentworth System)	Field Notes
				Fines		Sand					Gravel					
Drilling Depth (ft bgs)	Core Interval (ft)	Core Recovery (inches)	Vapor Reading (ppm)	clay	silt	very fine	fine	medium	coarse	very coarse	granule	pebble	cobble	boulder	Depth Interval (ft), PRIMARY TEXTURE, Principal and Minor Components with Descriptors (% modifiers and grain size fraction, angularity for coarse sand and larger, consistency/density, plasticity for silt and clay, dilatancy for silt/silt-sand); Sorting, Moisture Content, Color. NOTES: *Texture Modifiers: Trace (<10%), Little (10 to 20%), Some (21 to 35%), And (36 to 50%)*	Driller's Observations, Geologic Formation, Field Screening Results, Sample Interval etc.

Attachment E

Completed Boring Log

The purpose of this attachment is to provide an example of a completed boring log for reference purposes to field staff. The example provided is for a soil boring completed outside the waste mass of a closed municipal landfill near Baltimore, Maryland. The objective of the drilling program was to determine the depth to groundwater to determine the appropriate depth interval to install a soil gas monitoring well and groundwater monitoring well across the first water-bearing zone. The site geology consists of unconsolidated sediments of the Mid-Atlantic Coastal Plain, specifically the Upper Patapsco formation. These sediments were deposited in a moderate gradient fluvial environment during the Cretaceous period. The landfill was constructed into a regional clay confining unit.

BORING LOG

ARCADIS

Boring ID:	MW-08	**Project Name:**	Acme Landfill	**Page:**	1 / 1
Permit ID:	MD-PG-100	**Date Started:**	7/18/2018	**Ground Elevation:**	50.5 ft
Site Address:	100 Landfill Road	**Date Completed:**	7/18/2018	**Vertical Datum:**	NAVD 88, feet
City, State:	Baltimore, Maryland	**Total Depth:**	35 ft below ground	**Northing:**	123456.79
Drilling Co:	Earth Matters	**Depth to Water:**	19 ft below ground	**Easting:**	123456.79
Driller:	Rod E. Piper	**Hole Diameter:**	2-inch	**Horizontal Datum:**	NAD 83 feet, MD State
Drilling Method:	Direct-push/hollow-stem	**Core Device:**	5-foot macrocore sampler	**Prepared by:**	Sandy Pebbles
Boring Status:	completed as well	**Drilling Fluid:**	none	**Reviewed by:**	Clay Brown

Drilling Information				Graphical Log for Primary Texture											Soil Description (Udden-Wentworth System)	Field Notes
				Fines		Sand					Gravel					
Drilling Depth (ft bgs)	Core Interval (ft)	Core Recovery (inches)	VOC Vapor Reading (ppm)	clay	silt	very fine	fine	medium	coarse	very coarse	granule	pebble	cobble	boulder	Depth Interval (ft), PRIMARY TEXTURE, Principal and Minor Components with Descriptors (% modifiers and grain size fraction, angularity for coarse sand and larger, consistency/density, plasticity for silt and clay, dilatancy for silt/silt-sand); Sorting, Moisture Content, Color. NOTES: *Texture Modifiers: Trace (<10%), Little (10 to 20%), Some (21 to 35%), And (36 to 50%)*	Driller's Observations, Geologic Formation, Field Screening Results, Sample Interval etc.
0 to 1			< 1												0-0.5 ft, topsoil with organics	Grass covered area
1 to 2			< 1				X								0.5-5 ft, SAND, fine, trace silt, trace pebble, round; poorly sorted, moist, yellowish brown (7.5 YR 5/8). NOTE: some cementation, does not react with HCl	continuous macro-core logging
2 to 3	0-5	43.2/60	< 1				X									
3 to 4			< 1				X									cemented sand @3.6-4 ft
4 to 5			< 1				X									
5 to 6			< 1				X	X	X						5-10 ft, SAND, fine to coarse, round to subround; well sorted, moist, light to strong brown (7.5 YR 6/4 to 7.5 YR 5/6).	
6 to 7			< 1				X	X	X							
7 to 8	5-10	40.8/60	< 1				X	X	X							
8 to 9			< 1				X	X	X							
9 to 10			< 1				X	X	X							
10 to 11			< 1				X	X	X						10-12.5 ft, same as above with trace silt	
11 to 12			< 1				X	X	X							
12 to 13	10-15	36/60	< 1				X	X	X							
13 to 14			< 1				X	X	X						12.5 to 15 ft, same as above, color change to pink (7.5 YR 7/3) and reddish yellow (7.5YR 6/8)	
14 to 15			< 1				X	X	X							
15 to 16			< 1						X	X					15-18.9 ft, SAND, coarse to very coarse, round to subround; well sorted, moist, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 6/6)	
16 to 17			< 1						X	X						
17 to 18	15-20	55.2/60	< 1						X	X						
18 to 19			< 1		X	X	X								18.9-22.7 ft, SAND, very fine to fine, and SILT, coarse to very coarse, poorly sorted, wet, light gray (7.5YR 7/1)	water table encountered @ 18.9 ft
19 to 20			< 1		X	X	X									
20 to 21			< 1		X	X	X									
21 to 22			< 1		X	X	X									
21 to 23	20-25	36/60	< 1		X	X	X									
23 to 24			< 1	X	X										22.7-25 ft, CLAY and SILT, high plasticity, soft to stiff at 25 ft, dry to moist, light gray (2/5YR 7/1) w/ red mottling (2.5YR 4/6)	Middle Patapsco Confining Unit
24 to 25			< 1	X	X											
25 to 26			< 1	X	X										25-31.1 ft, CLAY and SILT, high plasticity, stiff; dry to moist, light gray (2/5YR 7/1) with red mottling (2.5YR 4/6)	
26 to 27			< 1	X	X											
27 to 28	25-30	30/60	< 1	X	X											
28 to 29			< 1	X	X											
29 to 30			< 1	X	X											
30 to 31			< 1	X	X											
31 to 32			< 1		X											
32 to 33	30-35 ft	60/60	< 1		X											
33 to 34			< 1		X										31.1-35 ft, SILT, low plasticity, high dilatancy; wet, gray (7.5YR 7/1)	End of direct-push boring @ 35 ft
34 to 35			< 1		X											

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TGI – Monitoring Well Development

Rev: 2

Rev Date: April 5, 2023

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	4/24/2017	All	Re-written as TGI	Marc Killingstad
	1	4/12/2022	All	Updated to new format and some minor content changes	Marc Killingstad
	2	4/5/2023	All	Annual review completed by Marc Killingstad. Updated document revision number and date, version control and signature page.	Marc Killingstad

Approval Signatures

Prepared by:		4/5/2023
	Jay Erickson (Preparer)	Date
Reviewed by:		4/5/2023
	Marc Killingstad (Subject Matter Expert)	Date

1 Introduction

This Technical Guidance Instruction (TGI) covers the development of screened wells used for obtaining representative groundwater information and samples from granular aquifers (i.e., monitoring wells).

Note: This TGI only applies to monitoring well development and not remediation (injection/extraction) well development.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

The objectives of monitoring well development are:

1. Repair damage to the borehole wall from drilling that can include clogging, smearing or compaction of aquifer materials;
2. Remove fine-grained sediment from the formation and filter pack that may result in high turbidity levels in groundwater samples;
3. To re-sort formation and filter pack material adjacent to the well screen;

4. To recover any drilling fluids (if used) that may affect the permeability of the formation and filter pack or alter the water quality around the well; and
5. To optimize the well efficiency and hydraulic communication between the well screen and the formation.

Successful monitoring well development is dependent on the following:

1. Hydrostratigraphy – Permeable formations containing primarily sand and gravel are more easily developed due to lower percentages of silt and clay material. Water in permeable formations can be moved in and out of the screen and/or through the formation easier than in less permeable deposits.
2. Well Diameter – Development tooling including brushes, surge blocks, pumps and jetting tools are more readily available for wells 4 inches in diameter and greater.
3. Well Design – Wells with filter packs and screens designed to match the formation through the analysis of formation sieve samples are easier to develop. An important aspect to well design is to minimize the size of the annular space between the formation and well screen. Adequate room must be allowed for the proper installation of well materials, but not too large as to prevent/reduce communication with the surrounding formation.
4. Drilling Methods – Different drilling methods result in varying amount of borehole damage and, therefore, impact the degree to which development will be successful.

Well development methods for monitoring wells include the following:

1. Bailing – Use of a bailer to remove water and sediment from the well casing. This technique does little to remove fines from the filter pack and may lead to bridging of sediment since the flow is in only one direction, toward the well screen. The most effective use of bailing during monitoring well development is in conjunction with other methods (e.g., surging/swabbing) to remove fines accumulated in the monitoring well between cycles of other development methods.
2. Pumping/over pumping – Use of a pump to remove water and sediment from the well casing, over pumping involves pumping the well at a rate that exceeds the design capacity of the well. Similar to bailing, this technique does little to remove fines from the filter pack and may lead to bridging of sediment since the flow is in only one direction, toward the well screen. Small diameter monitoring wells have the additional constraint on pump size and flow rates which further limit the effectiveness of this methodology.
3. Backwashing (rawhiding) – Consists of starting and stopping a pump intermittently to produce rapid pressure changes in a well. This method can produce better results than pumping alone since the procedure involves movement of the water in and out of the screen and formation. However, in many cases the surging action is not rigorous enough to fully develop the well and might be considered the final phase of development after a more rigorous method has been used. Again, small diameter monitoring wells have the additional constraint on pump size and flow rates which further limit the effectiveness of this methodology.
4. Surging/swabbing – Use of a mechanical surge block or swabbing tool to operate like a piston with an up and down motion. The downstroke causes a backwash action that breaks up bridged sediment and the upstroke pulls the dislodged sediment into the well. This method works well for both small and large diameter monitoring wells. Care should be taken on the downstroke so as not to force fines back into the formation, frequent pumping/purging during surging help to keep fines out of the well. Double surge blocks are recommended, and this is typically the most effective method for development of monitoring wells.

5. Jetting – Use of a tool fitted with nozzles that direct streams of water horizontally into well screens at high velocity. Due to the size of the tooling, this method is better suited for wells 4 inches in diameter and larger. The method is also more effective with wire-wrapped/continuous slot screens due to the increased open area. Jetting requires specialized equipment and concurrent pumping to prevent reintroducing fines into the filter pack. Additionally, depending on the configuration of the tool, jetting may require subsequent surging/pumping to remove fines dislodged in the filter pack and formation. Typically, jetting is not a preferred option for new well development but may be effective as part of a re-development/rehabilitation effort.

For most situations, surging/swabbing coupled with bailing or pumping to remove dislodged materials is recommended.

Final well development for properly designed and constructed monitoring wells may begin after the annular seal materials have been installed and allowed to cure, since these wells are designed to retain approximately 90% of the filter pack material. This cure time is typically at least 24 to 48 hours after the sealing materials have been installed.

This TGI is meant to provide a general guide for proper development of newly installed monitoring wells.

A site-specific field implementation plan (FIP) for well installation and development detailing the specific methods and tools is strongly recommended to provide site-specific instruction and guidance.

4 Personnel Qualifications

Generally, Arcadis field personnel will have completed or are in the process of completing site-specific training as well as having current health and safety training as required by Arcadis, client, and/or state/federal regulations, such as 40-hour HAZWOPER training and/or OSHA HAZWOPER site supervisor training. Arcadis personnel will also have current training as specified in the Health and Safety Plan (HASP) which may include first aid, cardiopulmonary resuscitation (CPR), Blood Borne Pathogens (BBP) as needed. In addition, Arcadis field sampling personnel will be knowledgeable in the relevant processes, procedures, and TGIs and possess the demonstrated required skills and experience necessary to successfully complete the desired field work. The HASP and other documents will identify other training requirements and access control requirements.

The designated Field Manager is responsible for periodic observation of field activities and review of field generated documentation associated with this TGI. The Field Manager is also responsible for implementation of corrective action if problems occur (e.g., retraining personnel, additional review of work plans and TGIs, variances to QC sampling requirements, issuing non-conformances, etc.).

Prior to mobilizing to the field, personnel will review and be thoroughly familiar with relevant site-specific documents including but not limited to the task-specific work plan or field implementation plan (FIP)/field sampling plan/work plan, Quality Assurance Project Plan (QAPP), HASP, historical information, and other relevant site documents.

Field personnel assigned to install and develop monitoring wells are responsible for completing their tasks in accordance with the specifications outlined in this TGI and other appropriate and relevant guidelines.

Monitoring well development activities will be performed by persons who have been trained in proper well development procedures under the guidance of an experienced field geologist, engineer, or technician.

5 Equipment List

Required equipment depends on the selected method and should be detailed in the site-specific FIP; however, the following are typically required.

- Approved site-specific Health and Safety Plan (HASP)
- Approved site-specific FIP which will include site map, well construction information/borehole information, and development plan
- Personal protective equipment (PPE) and health and safety equipment, as required by the HASP
- Field notebook and/or smart device (phone or tablet)
- Cleaning/decontamination equipment
  - Non-phosphate laboratory soap (Alconox or equivalent), brushes, clean buckets or clean wash tubs—new buckets or tubs will be purchased if it cannot be determined if the presentitems are clean
  - Distilled or de-ionized water for equipment decontamination
- Monitoring well keys
- Water-level meter
- Down-hole multiparameter water quality sonde (e.g., YSI)
- Plastic sheeting (e.g., Weatherall Visqueen) to protect all down-hole sampling equipment fromcontact with potential sources of contamination
- Well development forms/logs
- Well construction logs/diagrams
- Weighted tape (of sufficient length for maximum site depth)
- Turbidity meter
- Camera
- Watch/timing device

6 Cautions

Different USEPA regions and/or state regulatory agencies may stipulate deviations from this document. It is the responsibility of the Project Team (Project Manager and Technical Lead) to be fully aware of the requirements from the applicable regulatory framework.

Prior to beginning field work, the project technical team will ensure that all field logistics (e.g., access issues, health and safety issues, communication network, schedules, etc.) and task objectives are clearly understood by all team members. An internal call with the project technical team to review the FIP/field sampling plan/work plan scope and objectives is strongly recommended prior to mobilization to ensure that the field work will be effectively and efficiently executed.

Where surging is performed to assist in removing fine-grained material from the sand pack, surging must be performed in a gentle manner. Excessive suction could promote fine-grained sediment entry into the outside of the sand pack from the formation.

Avoid using development fluids or materials that could impact groundwater or soil quality or could be incompatible with the subsurface conditions.

In some cases, it may be necessary to add potable water to a well to allow surging and development, especially for new monitoring wells installed in low permeability formations. Before adding potable water to a well, the Certified Project Manager (CPM) and/or Project Hydrogeologist must be notified, and the CPM shall make the decision regarding the appropriateness and applicability of adding potable water to a well during well development procedures. If potable water is to be added to a well as part of development, the potable water source should be sampled and analyzed for constituents of concern, and the results evaluated by the CPM prior to adding the potable water to the well. If potable water is added to a well for development purposes, at the end of development the well will be purged dry to remove the potable water, or if the well no longer goes dry then the well will be purged to remove at least three times the volume of potable water that was added

7 Health and Safety Considerations

Field activities associated with monitoring well development will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities.

Appropriate PPE will be worn at all times in line with the task and the site-specific HASP.

Review all site-specific and procedural hazards as they are provided in the HASP, and review Job Safety Analysis (JSA) documents in the field each day prior to beginning work.

Access to well locations may expose field personnel to hazardous materials such as contaminated groundwater or NAPL (e.g., petroleum hydrocarbons, chlorinated solvents). Other potential hazards include pressurized wells, stinging insects that may inhabit well heads, other biological hazards (e.g., ticks in long grass/weeds around wellhead), and potentially the use of sharp cutting tools (scissors, knife). Open well caps slowly and keep face and body away while allowing to vent any built-up pressure to vent. Only use non-toxic peppermint oil spray for stinging insect nests. Review client-specific health and safety requirements, which may preclude the use of fixed/folding-blade knives and use appropriate hand protection.

Do not enter confined spaces unless following appropriate confined space entry procedures specified in the HASP.

If thunder or lightning is present, discontinue sampling until 30 minutes have passed after the last occurrence of thunder or lightning.

8 Procedure

As indicated above, for most monitoring wells, gentle surging coupled with bailing or pumping to remove dislodged sediment is recommended.

8.1 Preliminary Well Development

After installation of the primary filter pack around the monitoring well screen, preliminary well development is recommended be performed to ensure that the filter pack settles and does not bridge within the annular space. The preliminary well development steps are as follows:

1. Measure and record depth to water, total depth of well, and depth to top of the sand pack in the annulus.
2. Use steel or weighted bailer to remove any fines that have accumulated in the bottom of the well.
3. Lower an appropriately sized double-surge block into the screened portion of the well on a rigid pipe or high-density tubing and gently cycle up and down to force water in and out of the screen slots and formation. A two-foot throw is recommended (use tape or chalk marks on the pipe or tubing); however, the entire length of well screen must be gently surged.
4. Start above the screen and gently surge over two-foot intervals while working down to the screen bottom.

NOTE: Care must be taken not to surge the well too aggressively at this point as the casing is not well-supported and damage could occur. The objective is to create enough surging action to settle the primary filter pack and provide some preliminary removal of accumulated materials before final development.

NOTE: If possible, ensure that the developer surges the block upward faster than downward to pull the fines out of the filter pack, instead of forcing them back in (and allowing for proper settlement).

5. Monitor the total depth of the well periodically during surging to ensure that we are not pulling excessive amounts of filter pack through the screen and remove any debris accumulated in the well with a weighted bailer or pump.
6. Re-measure the top of the sand in the annulus to see if more sand pack is necessary. Remove any fines that have accumulated out of the well using a submersible pump or weighted bailer.

NOTE: If the monitoring well was drilled using mud rotary drilling methodology or if significant fines were encountered during the well installation, consider adding a commercially available 'mud' dispersant (e.g., AQUA-CLEAR PFD, Nu Well 220, etc.) as part of the preliminary development. This will help to break up the 'skin' along the borehole wall created by either the drilling fluid or smearing during drilling and assist in final development. Follow manufacturer's directions for dosing, and the mixture should be worked through the entire saturated screen interval by gently surging or brushing.

8.2 Final Well Development

After sufficient time has passed to allow for proper curing of the well seal/grout (i.e., 24 to 48 hours), final well development can be performed. Final well development steps are as follows:

1. Don appropriate PPE (as required by the site-specific HASP).
2. Place plastic sheeting around the well.
3. Clean all equipment entering each monitoring well, except for new, disposable materials that have not been previously used.
4. Open the well cover while standing upwind of the well, remove well cap. Insert PID probe approximately 4 to 6 inches into the casing or the well headspace and cover with gloved hand. Record the PID reading in

the field notebook. If the well headspace reading is less than 5 PID units, proceed; if the headspace reading is greater than 5 PID units, screen the air within the breathing zone. If the PID reading in the breathing zone is below 5 PID units, proceed. If the PID reading is above 5 PID units, move upwind from well for 5 minutes to allow the volatiles to dissipate. Repeat the breathing zone test. If the reading is still above 5 PID units, don the appropriate respiratory protection in accordance with the requirements of the HASP. Record all PID readings.

5. Obtain an initial measurement of the depth to water and the total well depth from the reference point at the top of the well casing. Record these measurements in the field logbook. It is recommended to use a weighted tape for the total well depth measurement.

6. The depth to the bottom of the well should be sounded and then compared to the completion form or construction diagram for the well. Any discrepancies should be reported immediately to the CPM and/or Project Hydrogeologist. If sand or sediment is present inside the well, it should first be removed by bailing. Do not insert bailers, pumps, or surge blocks into the well if obstructions, parting of the casing, or other damage to the well is suspected. Instead report the conditions to the CPM and/or Project Hydrogeologist and obtain approval to continue or cease well development activities.

NOTE: If the monitoring well was drilled using mud rotary drilling methodology or if significant fines were encountered during the well installation, it is recommended that a commercially available 'mud' dispersant (e.g., AQUA-CLEAR PFD, Nu Well 220, etc.) be included as part of the final well development to effectively break up the 'skin' along the borehole wall created by either the drilling fluid or smearing during drilling.

Per manufacturer's instructions, the general procedure for adding dispersant is as follows:

- i. *Determine volume of water in screen area and double the calculated volume to account for water in gravel pack and formation interface*
- ii. *Once the water volume is determined, calculate the required treatment volume of dispersant need per manufacturer's recommendations*
- iii. *Mix thoroughly before introducing into well*
- iv. *The preferable application method utilizes a tremie line with the product applied into the screened area*
- v. *Mixture should be thoroughly blended in well, then agitated via surging/swabbing/brushing repeatedly (e.g., every two hours) for a period of up to 24 hours*
- vi. *The dispersant should sit for at least 6 to 8 hours or overnight before continuing well development activities*

7. After allowing the dispersant to sit for the required time (if dispersant is used), start the mechanical development by lowering an appropriately sized double-surge block (or similar) into the well on a rigid pipe or high-density tubing.
   - i. Surging should start above the screen to reduce the possibility of "sand-locking" the surge block. Initial surging should be with a long stroke and at a slow rate (20 to 25 strokes per minute)
   - ii. After surging above the screen, the well should be cleaned via bottom-loading bailer, submersible pump, or inertia pump tubing with check valve to the bottom of the well

   iii. Begin surging at the lower end of the screen, gradually working upward, surging in 2-ft intervals until the entire screen has been developed.
   iv. Surge the well a minimum of 10 throws per 2-ft screen interval.
   v. Each interval may require several surge cycles to achieve the best development.
   vi. The entire length of well screen must be surged.
   vii. Ensure that the developer surges the block upward faster than downward to pull the fines out of the filter pack, instead of forcing them back in (and allowing for proper settlement)
   viii. measure total depth of the well periodically during surging to ensure that excessive amounts of sediment are not being pulled through the screen. Remove any debris accumulated in the well via simultaneous airlifting (if a combined tool is available) or with bailing/pumping.

8. After completing a cycle of surging, lower a bottom-loading bailer, submersible pump, or inertia pump tubing with check valve to the bottom of the well and gently bounce on the bottom of the well to collect/remove accumulated sediment, if any. Remove and empty the bailer, if used. Repeat until the bailed/pumped water is free of excessive sediment and contact at the bottom of the well feels solid. Alternatively, measurement of the well depth with a weighted tape can be used to verify that sediment and/or silt has been removed to the extent practicable, based on a comparison with the well installation log or previous measurement of total well depth.
9. After surging the well for a minimum of two cycles and removing excess accumulated sediment from the bottom of the well, re-measure the depth-to-water and the total well depth from the reference point at the top of the well casing. Record these measurements in the field log book.
10. Remove formation water by pumping/bailing.
   i. Where pumping is used, measure and record the pre-pumping water level.
   ii. Operate the pump at a relatively constant rate
   iii. Measure the pumping rate using a calibrated container and stopwatch, and record the pumping rate in the field log book
   iv. Measure and record the water level in the well at least once every 5 minutes during pumping
   v. Record any relevant observations in terms of color, visual level of turbidity, sheen, odors, etc.
   vi. Pump or bail until termination criteria specified in the site-specific FIP are reached
   vii. Record the total volume of water purged from the well

NOTE: The FIP may also specify a maximum turbidity requirement for completion of development. Unless otherwise specified the maximum turbidity should be 50 NTUs or less

11. While developing, take periodic water level measurements (at least one every five minutes) to determine if drawdown is occurring and record the measurements on the Well Development Log.
12. While developing, calculate the rate at which water is being removed from the well. Record the volume on the Well Development Log.
13. While developing, water is also periodically collected directly from the well or bailer discharge and readings taken of the indicator parameters: pH, specific conductance, and temperature. Development is

considered complete when the indicator parameters have stabilized (i.e., three consecutive pH, specific conductance, and temperature readings are within tolerances specified in the project work plans or within 10% if not otherwise specified), the extracted water is clear and free of fine sediment and most importantly, when acceptable volume of water has been removed and/or a sufficient amount of surging has been performed.

14. In certain instances, for slow recharging wells, the parameters may not stabilize. In this case, well development is considered complete when minimal amounts of fine-grained sediments are recovered, and an acceptable volume of water has been removed.
15. If the well goes dry, stop pumping or bailing. Note the time that the well went dry. After allowing the well to recover, note the time and depth to water. Resume pumping or bailing when sufficient water has recharged the well.
16. Contain all development water in appropriate containers.
17. When complete, secure the lid back on the well.
18. Place disposable materials in plastic bags for appropriate disposal and decontaminate reusable, downhole pump components and/or bailer

9 Waste Management

Investigation-Derived Waste (IDW), including purge water and decontamination liquids, will be stored on site in appropriately labeled containers and disposed of properly. Disposable materials will be stored and disposed of separately. Containers must be labeled at the time of collection and will include date, location(s), site name, city, state, and description of matrix contained (e.g., water, PPE). Waste will be managed in accordance with the *TGI – Investigation-Derived Waste Handling and Storage*, the procedures identified in the FIP/field sampling plan/work plan or QAPP as well as state-, federal- or client-specific requirements. Be certain that waste containers are properly labeled and documented in the field log.

10 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

All well development activities will be documented on appropriate log forms as well as in a proper field notebook and/or PDA. Additionally, all documents (and photographs) should be scanned and electronically filed in the appropriate project directory for easy access. Pertinent information will include personnel present on site; times of arrival and departure; significant weather conditions; timing of well development activities; development method(s); observations of purge water color, turbidity, odor, sheen, etc.; purge rate; and water levels before, during, and after pumping.

Management of the original documents from the field will be completed in accordance with the site-specific QAPP. Records generated as a result of this TGI will be controlled and maintained in the project record files in accordance with project requirements.

Development activities will be documented on appropriate field logs as well as in a proper field notebook. All field data will be recorded digitally or with indelible ink. Field forms, logs/notes (including daily field and calibration logs), digital records, and chain-of-custody records will be maintained by the field team lead. Any deviations or omissions from this TGI should be documented.

Initial field logs and forms will be transmitted to the Arcadis CPM and/or Technical Lead at the end of each day unless otherwise directed by the CPM. The field team leader retains copies of the field documentation.

11 Quality Assurance

Quality assurance procedures will be conducted in accordance with the Arcadis Quality ManagementSystem or the site-specific QAPP. Refer to the QAPP or FIP/sampling plan/work plan for specific requirements.

12 References

American Society for Testing Materials (ASTM), Designation D5521-05. *Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers*. American Society for Testing Materials. West Conshohocken, Pennsylvania.

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TGI – Monitoring Well Inspection Assessment

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Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	4/19/2017	All	Re-written as TGI	Patrick Nolan M. McCaughey
	1	6/30/2022	All	TGI Title change from “Monitoring Well Integrity Survey” to “Monitoring Well Inspection Assessment” New Format	M. McCaughey

ARCADIS

Approval Signatures

Prepared by:	Matthew C. McCaughey	6/30/2022
	Matthew C. McCaughey (Preparer)	Date
Reviewed by:	Matthew C. McCaughey	6/30/2022
	Matthew C. McCaughey (Subject Matter Expert)	Date

1. Introduction

This Technical Guidance Instruction (TGI) specifies the procedures for performing inspections and inventories of existing monitoring wells.

2. Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3. Scope and Application

Monitoring well inventories are periodically conducted to assess the condition of existing monitoring wells and to identify the need for repairs, replacement of parts, or replacement of wells that are no longer usable. A well inventory involves an inspection of the overall condition of the well, comparison of measurable quantities (e.g., riser stickup relative to grade and total depth), general verification of survey coordinates and elevation, and measurement of depth to water in the well.

This TGI applies to piezometers constructed analogous to monitoring wells. For simplicity, such piezometers are also referred to as monitoring wells for the remainder of this document. For all other types of wells (e.g., remediation wells such as injection, extraction, sparge, etc.), please refer to the appropriate guidance document regarding procedures for conducting inspections on those specific wells.

4. Personnel Qualifications

Arcadis field personnel will have completed or are in the process of completing site-specific training as well as having current health and safety training as required by Arcadis, client, or regulations, such as 40-hour HAZWOPER training and/or OSHA HAZWOPER site supervisor training. Arcadis personnel will also have current training as identified in the site-specific Health and Safety Plan (HASP) which may include first aid, cardiopulmonary resuscitation (CPR), Blood Borne Pathogens (BBP) as needed. The HASP will also identify any access control requirements.

Prior to mobilizing to the field, the team will review and be thoroughly familiar with relevant site-specific documents including but not limited to the task-specific work plan or field implementation plan (FIP)/field sampling plan, Quality Assurance Project Plan (QAPP), HASP, historical information, and other relevant site documents.

Arcadis personnel will be knowledgeable in the relevant processes, procedures, and TGIs and possess the demonstrated required skills and experience necessary to successfully complete the desired field work. Additionally, the Arcadis team will review and be thoroughly familiar with documentation provided by equipment manufacturers and become familiar with the operation of (i.e., hands-on experience) all equipment that will be used in the field prior to mobilization.

The well inspection assessment procedures described below will be carefully adhered to and conducted under the supervision of an experienced geologist, engineer, or other qualified individual. Ideally, Arcadis personnel directing, supervising, or leading well assessment activities will have a minimum of one (1) year of field experience. It is recommended that field employees with less than six (6) months of experience be accompanied by a supervisor (as described above) to ensure that adequate survey techniques are employed.

The Arcadis CPM will be responsible for periodic observation of field activities and review of field generated documentation associated with this TGI and for implementation of corrective action if well conditions necessitate them.

5. Equipment List

The following materials will be available, as required, during performance of a monitoring well inventory:

- Health and safety equipment (as required by the site-specific Health and Safety Plan)
- Ruler or tape measure
- Water level indicator and/or interface probe
- Bailer
- Metal detector
- Indelible ink pen
- Paint pen
- Well keys
- Wrenches or ratchet set for accessing flush-mount well covers
- Cleaning equipment

- Well construction information (e.g., construction log, as-built, summary table, etc.)
- Digital camera (or phone with camera)
- Field notebook and digital data collection device (tablet or smartphone)
- Appropriate field form(s) (see Attachment A)

If feasible, a supply of typical replacement parts (e.g., locks, bolts, well caps) should be available to enable immediate usage, as necessary.

6. Cautions

It is important to confirm the correct identity of wells, particularly to those installed in a cluster. In these cases, however, the wells usually differ significantly in terms of depth below grade. During the well inspection assessment, verify that all wells are properly labeled by comparing their measured depth to the reported depth as installed. If the well identity is incorrectly labeled or not labeled, provide a clear, correct label using an indelible ink pen on the inside of the steel protective cover for the well, or on the outside of the steel protective cover using a paint pen. Take photos to document, as necessary.

One challenge with performing this task is locating existing monitoring wells in the field. Compilation and use of existing well records such as well location photos and aerial map images (e.g., Google Earth) are recommended. Note that the Well inspection Survey Assessment Form (**Attachment A**) includes a sketch area to help locate wells in future surveys.

If present, remove standing water from the curb box using a bailer before opening the monitoring well. Refer to project waste management plan for proper disposal of water.

7. Health and Safety Considerations

Field activities associated with monitoring well installation will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities. Care should be taken using tools to access flush-mount curb boxes. Wells in or near roadways may require a traffic control plan and traffic control measures (such as cones, flagging, and/or signs) prior to accessing. Access to wells containing chemicals of concern may pose a chemical exposure and biological hazard.

8. Procedure

The typical procedure for assessing the integrity of a monitoring well is outlined below.

8.1 Planning

Compile a list of wells to be inventoried and available information concerning their location and physical characteristics including photos and aerial maps.

8.2 Well Inspection Assessment

The well inspection procedure is described below:

- Locate the monitoring well using site maps and, if needed, a metal detector. Record field observations using the FieldNow application on digital device or an appropriate field form.
- Two field forms are provided in **Attachment A**. The first form is designed for a detailed description of an individual well inspection, while the second form is designed for the collection of multiple well inspections and observations on one page and can be used as a report summary table.
- Examine the well for the presence of an identification label. If absent, label the well with the appropriate well number after measuring the total depth of the well to verify that the depth matches the well number. If the well identity is incorrectly labeled or not labeled, provide a clear, correct label using an indelible ink pen on the inside of the steel protective cover for the well, and on the outside of the steel protective cover using a paint pen.
- Examine the surface condition of the well. Record the type of well (i.e., flush mount or above-grade stickup), condition of the well cover and surface seal. Confirm the protective casing is not bent or rusted through, the PVC casing is not broken or chipped, there is no evidence of frost heaving or subsidence.
- Unlock and open the well. Record the type (e.g., PVC or stainless steel), dimensions (i.e., casing diameter and riser stickup relative to grade), condition of the well casing, and type of well cap. Record any observations of recent modifications of the well casing. If the well cap is missing, replace with available parts or record the type of cap required.
- Measure the above-grade portion of the well riser stickup and compare to the known length of the stickup measured during well installation (surveyed top of inner casing elevation minus ground surface elevation). If the difference between the observed stickup length and the known stickup length is greater than 0.1 foot, the monitoring well location and elevation should be re-surveyed.
- Locate the marked measuring point along the top of the well casing. If no mark is visible, add a mark at the highest point of the casing using an indelible ink pen.
- Measure the depth to water, total depth of the well and any non-aqueous phase liquids (NAPL) thicknesses. For total depth measurements, account for any difference in calibration of the measuring tape on the probe (i.e., distance from part of probe that measures depth to water and the physical bottom of the probe that will measure total depth of the well). Record any obstructions encountered and a description of the feel of the well bottom (i.e., soft due to sediment or hard).
- Compare observations concerning the measured dimensions of the well with the listed values. Based on these results as well as other observations concerning the condition of the well, record any appropriate recommendations on the Well Inspection form (**Attachment A**).
- Perform any recommended maintenance activities that can be accomplished with available equipment.
- Remove all equipment from the well. If no additional maintenance activities are to be performed, close the well and collect all personal protection equipment (PPE) and other wastes generated for disposal.

8.3 Post-Assessment Activities

Depending on the results of the well inventory, several additional activities may be warranted prior to future usage of the well. Typical follow-up activities include replacement of missing parts, removal of sediment from the base of the well, re-surveying of the well, or complete replacement if the well is determined to be unusable.

As stated above, a supply of locks, bolts, and well caps should be available for immediate usage during performance of the well inventories. However, it may not be feasible to maintain a supply of all potential replacement parts due to the variety of well types in use. Therefore, a list of required replacement parts should be compiled during the performance of a well inventory event. At the conclusion of the event, the necessary replacement parts for all wells should be obtained and installed.

9. Waste Management

Materials generated during well inventory activities, including disposable equipment, will be disposed in appropriate containers.

10. Data Recording and Management

10.1 Digital Data Collection Process Overview

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

10.2 Digital Data Collection Tools for Well Inspections

Arcadis is transitioning from the use of paper forms to digital field forms using web based FieldNow applications accessible on field tablets and smart phones. Company-wide roll out of a FieldNow application for a Well Inspection app is targeted by the end of 2022. Paper forms are included in Revision 1 (June 2022) of this TGI. Specifically, a blank well inspection form is provided in **Attachment A**. Additional guidance and examples of the digital data collection tools for soil descriptions will be provided in the next revision to this TGI.

11. Quality Assurance

Field measurements will be double-checked periodically (e.g., at least one of these measurements per well should be repeated to verify accuracy).

12. References

No references apply to this TGI.

Attachment A

Monitoring Well Inspection Form

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Monitoring Well Integrity Assessment Form

(For each item, check appropriate response or fill in the blank)

Date ____________________

Well ID __________ ID Clearly Marked? __________ Project Name ____________________

Photo filename ____________________ Project Number ____________________

Weather ____________________ Field Personnel ____________________

General Description of Surroundings ____

Well Condition:

Damaged? ☐ *(Describe Below)* Abandoned? ☐

Stick Up ☐ Flush Mount ☐

Lockable cover? ____________________

Lock present? ____________________

Key number: ____________________

Stick up height ____________________

Casing material ____________________

Well diameter ____________________

Protective casing material: ____________________

Protective casing diameter: ____________________

Cap present? Type? ____________________

Vented? If so, how? ____________________

Measuring point clearly marked? ____________________

Total depth reported: ____________________

Total depth measured: ____________________

DTW: ____________________

Well obstructed? If so, depth? ____________________

Well bottom soft (sediment) or firm? ____________________

Flush Mount Wells Only

Gasket present? ____________________

Bolts present? ____________________

Teflon washers present?

Surface Condition:

Damaged? ☐ *(Describe Below)*

Pad/cement intact? ____________________

Curb box/well cover present? ____________________

Intact? ____________________

Seal condition ____________________

All bolts present? ____________________

Ground surface slopes away from well? ____________________

Location Sketch

Comments/Recommendations:

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TGI – Poly-and Perfluorinated Alkyl Substances (PFAS) Potable Water Sampling Guidance

Rev: 3.1

Rev Date: March 20, 2025

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
--	0	November 16, 2017	All	Initial Release	Erica Kalve, Erika Houtz
Analytical Updates Needed	1	November 5, 2019	All	General Updates to Sampling TGI, including references to USEPA Method 537.1 Version 1	Lisa Rutkowski
Outdated Template	2	December 10, 2021	All	Updated to current TGI format. Also updated sections to match the most recent TGI for PFAS Field Sampling Guidance (Arcadis 2021)	Kevin Engle
Template Updates	3	February 21, 2022	All	Additional template updates	Kevin Engle, Johnsie Lang
Annual Review	3.1	March 20, 2025		Editorial changes to revision number	Johnsie Lang

Approval Signatures

Prepared by: 3/20/2025

Kevin Engle, PG (WY) Date

Reviewed by: 3/20/2025

Johnsie Lang, PhD (Subject Matter Expert) Date

1 Introduction

This document is intended to provide guidance to field staff sampling for Per- and Polyfluoroalkyl Substances (PFAS) in potable water. The content in this document describes the intended use, scope and application, personnel qualifications, equipment, cautions, health and safety considerations, procedures, waste management, data recording and management, and quality assurance of PFAS sampling.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

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3 Scope and Application

The purpose of this document is to provide guidance on sampling for poly-and perfluorinated alkyl substances (PFASs) from potable water supplies. This protocol was adapted from various sources including the United States (US) Department of Defense, US Army Corp of Engineers (USACE) Omaha, Transport Canada, US Environmental Protection Agency (US EPA), and Michigan Department of Environment, Great Lakes, and Energy.

Given the extremely low detection limits associated with PFAS analysis and the many potential sources of trace levels of PFAS, field personnel are advised to err on the side of caution by strictly following these protocols to mitigate the potential for false detections of PFASs. Specific items related to field sampling for PFASs are discussed in the sections below.

4 Personnel Qualifications

4.1 Sampling Personnel

Field personnel must have current health and safety training, including 40-hour HAZWOPER training, site supervisor training, and site-specific training, as needed. In addition, field personnel must possess the skills and experience necessary to successfully complete the desired field work. The site Health and Safety Plan (HASP) and other documents will identify any other training requirements such as site-specific safety training or access control requirements.

4.2 Laboratories

As of this writing, the preferred method to analyze PFAS in drinking water is USEPA Method 537.1 Version 1.0, issued in November 2018. A laboratory accredited by the relevant federal or state accreditation agency for USEPA Method 537.1 Version 1.0 should be used to conduct the PFAS analysis.

These laboratories are examples of laboratories that may be used to analyze potable water for PFASs:

- TestAmerica Eurofins
- SGS
- Vista
- Pace

Other laboratories may be selected for analysis if they have the appropriate accreditation.

5 Equipment List

The following equipment and materials must be available for sampling:

- Site plan of sampling locations, relevant work plan (or equivalent), and this guidance document;
- Appropriate health and safety equipment, as specified in the site Healthy and Safety Plan (HASP);
- Pens, pencils, and/or fine point Sharpies® for writing;
- Clipboards, field binders, and field note pages that are not waterproof;
- High-density polyethylene (HDPE) sample bottles fitted with polypropylene or HDPE screw cap only;
- Sample labels;
- Ziploc® bags to hold wet ice and samples;
- Laboratory-supplied PFAS-free water;
- Stainless steel or PVC bailer for samples that cannot be collected out of a tap
- Coolers;
- Wet ice;
- Methanol for cleaning reusable sampling equipment (if available);
- Packing and shipping materials; and

- Chain-of-Custody (COC) Forms.

6 Cautions

6.1 Food Packaging

Some food packaging may be treated with PFAS-containing chemicals to prevent permeation of oil and water in the food outside of the packaging. To avoid potential food packaging-related PFAS contact:

- Do not bring any food outside of the field vehicles on site, and eat snacks and meals off site.
- Wash hands after eating.
- Remove any field garments or outer layers prior to eating. Do not put them back on until done eating and hands are washed.

6.2 Field Gear

6.2.1 Clothing

Many types of clothing are treated with PFASs for stain and water resistance, in particular outdoor performance wear under brand names such as Gore-Tex® or eVent™. To avoid potential clothing-related PFAS contact:

- Do not wear any outdoor performance wear that is water or stain resistant, or appears to be. Err on the side of caution.
- Wear pre-laundered (multiple washings, i.e. 6+) clothing that is not stain resistant or water proof. (unless made from the materials listed in Section 5.3.1 of the TGI for PFAS Field Sampling Guidance (Arcadis 2021).
- Natural fabrics such as cotton are preferred. Synthetic fabrics may also be acceptable if there is no indication on the label that the fabric is water and/or stain resistant.
- Most importantly, avoid contacting your clothing with sampling equipment, bottles, and samples.

6.2.2 Personal Protective Equipment

Safety Footwear

Some safety footwear has been treated to provide a degree of waterproofing and increased durability and may represent a source of trace PFAS. If at all possible, Gore-Tex footwear should not be worn and safety footwear without waterproofing should be worn; footwear that provides adequate safety from physical hazards is required and takes precedence over potential PFAS concerns. To avoid any PFAS cross contamination to samples from footwear:

- Do not touch your safety footwear in the immediate vicinity of the sampling port (i.e., within 2 feet).
- Do not allow gloves used for sampling to come in contact with safety footwear.

Nitrile Gloves

- Wear disposable, powderless nitrile gloves at all times. Don a new pair of nitrile gloves before the following activities at each sample location:
- Contact with sample bottles or "PFAS-free" water bottles;
- Handling of any quality assurance/quality control (QA/QC) samples including field blanks and equipment blanks.

Don a new pair of nitrile gloves **after** the following activities:

- Contacting contaminated surfaces; or
- When judged necessary by field personnel.

6.3 Personal Hygiene

Some personal care products may contain PFASs. To minimize potential for cross-contamination from personal care products:

- Shower at night.
- Do not use personal care products after showering such as lotions, makeup, and perfumes, UNLESS medically necessary.
- Use sunscreen and insect repellent as necessary for health and safety, i.e., if sampling is to occur outdoors in direct sunlight and/or if insect hazards may be present. Specific products that are acceptable for PFAS sampling are listed in Table 1 and in Section 6.1. Apply sunscreen and insect repellant prior to initiating field sampling. If sunscreen and/or repellant need to be reapplied, ensure a safe distance away from the sampling locations and equipment (i.e., more than 10 meters (m) away). Wash hands after application and don new gloves following hand washing.

6.4 Visitors

If possible, visitors to the site are to remain at least 10 m from sampling areas.

7 Health and Safety Considerations

- Field activities must be performed in accordance with the site HASP, a copy of which will be present on site during such activities.
- Use caution when removing well caps as well may be under pressure, cap can dislodge forcefully and cause injury.
- Additional health and safety considerations can be found in TGI for PFAS Field Sampling Guidance (Arcadis 2021)

8 Procedure

The following section details the sample collection procedure for potable water. For additional sampling considerations, reference the TGI for PFAS Field Sampling Guidance (Arcadis 2021).

8.1 Sample Collection

Different laboratories may supply sample collection bottles of varying sizes, however all sample bottles should be made of HDPE plastic with polypropylene or HDPE plastic, unlined lids. The laboratory should specify the amount of sample required for the analysis given the anticipated detection levels.

8.1.1 Sample Containers

- Collect samples in HDPE bottles fitted with an unlined (no Teflon™), polypropylene or HDPE screw cap.
- Sample bottles must contain Trizma® preservative if samples are being collected from a chlorinated water source. The laboratory should specify the amount added to the sample container.
- Complete bottle labels after sample collection, once the caps have been placed back on each bottle.
- Do not use glass bottles due to potential loss of analyte through adsorption to glass.

8.1.2 Potable Water Sampling

Before Sample Collection

- Don a new set of powderless nitrile gloves. Do not use gloved hands to subsequently handle papers, pens, clothes, etc., before collecting samples.
- Use the HDPE bottles that are supplied by the laboratory. Samples bottle caps must remain on the bottle until immediately prior to sample collection, and the bottle must be sealed immediately after sample collection. This will minimize the potential for contamination of the sample. The bottle cap must remain in the other hand of the sampler, until replaced on the bottle. Sample bottles will not be rinsed during sampling.
- Inspect the tap prior to sampling as potable water outfalls and taps are likely to vary.
    - Avoid sampling from any taps fitted with Teflon tape or other PFAS-containing materials. If a sample can only be taken from a tap fitted with PFAS-containing materials, remove these materials prior to sampling if possible. Annotate the presence of these materials in the field notes.
    - Sample from a ~~cold water~~cold-water line only.
    - Whenever possible, remove any attachments from the taps, including aerators, screens, washers, hoses, and water filters. Annotate the presence of these materials in the field notes.
    - Stainless steel and PVC are tap materials that are not expected to bias PFAS results.

During Sample Collection

- If sampling from a tap or port, in accordance with US EPA Method 537.1 sample collection procedures, begin flow from the water source and allow the system to flush for at least 3 minutes. Then, collect the sample under the still running tap.
- If a port or tap is not available to collect the water sample, use a stainless steel or HDPE bailer that has been pre-rinsed with methanol (if available) and PFAS-free water. A pump may be used if needed, but new silicone and/or HDPE outflow tubing should be used for each sample and any wetted pump parts should be decontaminated with methanol (if available) and PFAS-free water.
- Collect the sample into the HDPE bottle until the sample bottle is full to the neck of the bottle. Do not filter and do not overflow the bottle, as the preservative used for chlorinated samples may be lost. Tightly screw on the polypropylene or HDPE cap.

After Sample Collection

- Place each sample bottle in two sealed Ziploc® bags. Another brand of LDPE bag is acceptable.
- Record the sample name and time of sampling on the sample bottle label, in the field notes, and on the COC form. Record notes about the tap, including any attachments, or the conditions of how the sample was collected in the field notes.
- Place samples in coolers that are durable in transportation and keep the temperature between 0 and 4ºC with wet ice until transported to the laboratory. The temperature should not exceed 10ºC during the first 48 hours after sample collection, per USEPA Method 537.1.
- Treat all disposable sampling materials as single use and dispose of them appropriately after sampling at each location.

8.2 Shipping

- If samples cannot be received at the laboratory the next day (e.g., Friday sample collection), delay shipment until samples can be assured to be received. Note that samples must be extracted within 14 days of sample collection, per USEPA Method 537.1. The laboratory has an additional 28 days before the sample extract must be analyzed.
- If samples cannot be shipped the same day as collected, arrange an appropriate means of keeping the samples cool overnight (e.g., a refrigerated room or extra wet ice) and maintain the temperature between 0 and 4°C. The temperature should not exceed 10ºC during the first 48 hours after sample collection, per USEPA Method 537.1.
- For shipping, store labeled samples in coolers suitable with wet ice stored in Ziploc® bags.
- Complete the appropriate procedures for COC handling, packing, and shipping.
- Fill out and check COC forms against the labels on the sample bottles progressively after each sample is collected.

Ship samples via FedEx using priority overnight delivery. Tracking numbers for all shipments should be provided and recorded to ensure their timely delivery.

9 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

If digital data collection isn’t possible, waterproof field books should be avoided for field notes. Instead, field notes on loose paper on Masonite, plastic, or aluminum clip boards is preferred. Please note that newer Rite in the Rain® notebooks are approved for PFAS sampling. Other requirements for field notes include:

- Pens, pencils, and fine point Sharpies® may be used.
- Keep field notes and writing implements away from samples and sampling materials.
- Do not write on sampling bottle labels unless the sample bottle covers are tightly closed.
- Complete sampling logs in their entirety.
- Make sure COC forms are properly completed. Verify that the analysis method requested is US EPA Method 537.1 for potable water and includes the appropriate analytes desired for analysis.

10 Quality Assurance

Refer to quality control requirements for the project to ensure that appropriate QA/QC samples are collected. When collecting QA/QC samples, the same guidelines apply as when collecting regular samples – specifically that:

- Samples should be collected in laboratory-supplied HDPE bottles;
- Bottle caps must remain in the hand of the sampler until replaced on the bottle;
- Labels must be completed after the caps have been placed back on each bottle; and
- Samples must be stored in appropriate transport bottles (coolers) with ice (Ziploc® bags for use as ice containers) with appropriate labeling.

10.1 Field Duplicates

Project requirements may include the collection of one or more duplicate samples. If required, one field duplicate for every 20 samples collected or one per day, whichever is more frequent, is a typical collection frequency. Each duplicate sample will be collected immediately after the initial sample of which it is a duplicate into a separate laboratory-provided sample bottle. Do not indicate to the laboratory which sample the duplicate replicates (i.e., it should be given a blind reference on the COC form and given a sample name such as “duplicate”).

10.2 Field Blanks

QA/QC sampling for PFASs typically includes the submission of one laboratory supplied reagent field blank per day or per site. The PFAS-free water used for the reagent field blank sample is brought to the site in a laboratory-supplied bottle. Field staff should transfer the laboratory-supplied PFAS-free water into an empty sample bottle. This reagent field blank should be placed in the same cooler as other PFAS samples.

If a sampling bailer is used to collect the sample, PFAS-free water may be used to take an equipment blank through the sampler and then collected into a new sampling container.

Trip blanks are not needed, as the PFAS to be analyzed are not volatile.

10.3 Matrix Spike/ Matrix Spike Duplicate

Project requirements may include the collection of one or more matrix spikes or matrix spike duplicates. If required, one matrix spike and matrix spike duplicate for every 20 samples collected or one per day, whichever is more frequent, is a typical collection frequency. Each matrix spike sample will be collected immediately after the unspiked sample into a separate laboratory-provided sample bottle; the matrix spike and its duplicate will each require their own containers. The matrix spike and matrix spike duplicate should be clearly indicated on the laboratory COC, however their location should remain blind. The laboratory will add the appropriate chemical spike once the sample returns to the laboratory.

10.4 Laboratory Analytical QA/QC

- Internal laboratory QA/QC should consist of one laboratory blank and one laboratory control sample (or blank spike) per batch of samples, and additional QA/QCs as indicated by the laboratory QA/QC procedures. For potable water, the laboratory should follow the methodology and be accredited for analysis according to US EPA Method 537.1 Version 1. Updated potable water analytical procedures may become available and should be considered at that time.
- As part of the internal QA/QC, relative percent difference (RPD) should be calculated between samples and corresponding field or laboratory duplicates. The laboratory quality assurance portion of the laboratory certificates should be reviewed to verify that all calculations/recoveries were within acceptable limits as established by the laboratory method, typically 20% RPD.

11 References

Arcadis. 2021. TGI – Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance. Rev. 9. October 22.

Michigan Department of Environment, Great Lakes, and Energy. 2018. Residential Well PFAS Sampling Guidance. October 10. Accessed at: https://www.michigan.gov/documents/pfasresponse/Residential_Well_PFAS_Sampling_Guidance_634601_7.pdf

U.S. Army Corps of Engineers – Omaha District. 2016. Chemistry Requirements – PFAS.

U.S. Environmental Protection Agency. 2018. USEPA Method 537.1: Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Version 1.0, November. National Exposure Research Laboratory, Office of Research and Development.

Transport Canada. February 2016, Per-and Polyfluorinated Alkyl Substances (PFAS) Field Sampling Guidance.

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TGI – Per- and Polyfluoroalkyl Substances (PFAS) Field Sampling Guide

Rev: 12

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Version Control

Revision No.	Date Issued	Page No.	Description	Reviewed By
0	April 27, 2017	All	Initial Release	Erica Kalve Erika Houtz Sue Tauro
1	June 19, 2018	1 through 4 and 17	Updated Information on Sampling Materials	Erica Kalve Erika Houtz
2	October 15, 2018	6 to 16	Minor updates on laboratory elements, updates to decontamination procedures, and clarification on equipment and reagent blank collection	Erika Houtz Erica Kalve
3	December 17, 2018	4, 6, 17	Removed Sharpies from acceptable field writing implements; Changed language in Section 3.2 and Section 10.5 to provide stricter guidance for DoD projects.	Erika Houtz, Erica Kalve
4	March 26, 2019	4,5	Removed Citranox from acceptable Decon solutions in Table 1a, added all fluoropolymer containing materials to prohibited items in Table 1b. Made a correction that Liquinox contains trace levels of 1,4 Dioxane, not Alconox.	Erika Houtz
5	October 16, 2020	14	Added Air Force preference to sample surface water at surface for Air Force investigations.	Erika Houtz
6	March 23, 2021	4, 5, 7, 12, 13, 14, 15, 16, 17	Made clarifications that fine/ultra-fine point Sharpies are allowed. Referenced 2018 MDEQ sampling guidance. Made updates to 'After Sample Collection' in Section 7.	Kevin Engle

7	April 18, 2021	All	Changed title from Poly- and Perfluoroalkyl Substances to **"Per- and Polyfluoroalkyl Substances"** and changed PFASs to PFAS.	Rosario Varrella, Erika Houtz
8	May 4, 2021	12, 13, 15, 16	Clarified that sample containers should have an HDPE lined screw cap and that LDPE plastic sheeting should be used.	Kevin Engle, Erika Houtz
9	October 20, 2021	Note that numbers have shifted one page forward relative to prior versions. 5, 7, 9-12, 15, 16, 18-25.	Specific acceptable sunscreen and insect repellent brands were added to Table 1. Clarified language regarding footwear and H&S trainings. Laboratories section and Section 10.5 was updated to reflect new laboratory names and an updated version of the QSM. Sections 5 and 6 were updated to provide clearer language on health and safety protocols for sunscreen, insect repellent, and rain events. Added language to specify decontamination of reusable equipment prior to initial use in Section 7.1. Section 8 on Waste Management was updated to state that waste storage and disposal should be determined in the site specific workplan. Section 9 was updated to include Rite in the Rain® notebooks as approved for PFAS sampling. Changed the term "sample port" to "sample location" when describing where to place plastic sheeting. Section 10.1 was updated to indicate an equipment blank can be collected for unvetted hazard controls that contact a sample. References were updated to include the newer version of the DoD QSM, MDEQ Sampling Guidance, and	Kevin Engle, Erika Houtz

			California State Water Board PFAS Sampling Guidance.	
10	January 26, 2022	Various, Section 7	TGI formatted to comply with new QMS TGI template and Arcadis brand compliance. Indicated to avoid use of anti-fog spray on safety glasses due to possible presence of PFAS.	Rosario Varrella, Kevin Engle
11	January 13, 2023	Various	TGI updated to include specific information found in the June 2022 ITRC Guidance document. Updates reflecting current state of the practice analytical procedures. Table 1a and Table 1b updates	Kevin Engle, Joey Matzke, Lauren March
12	September 20, 2023	Various	Decontamination procedure in Section 8.1 has been updated to remove solvent rinse. Procedure is now: Scrub with alconox, rinse with DI/distilled water, rinse with “PFAS-free” water, repeat. Updated “Shipping” section 8.4, allowing for Saturday delivery with laboratory approval. Made various minor corrections and clarifications related to specific brand names	Alexander Hamilton, Johnsie Lang

Approval Signatures

Prepared by:		9/20/2023
	Alexander Hamilton, PG Geologist (Preparer)	Date
Reviewed by:		9/20/2023
	Johnsie Lang, PhD (Subject Matter Expert)	Date

1 Introduction

This document is intended to provide guidance to field staff sampling for Per- and Polyfluoroalkyl Substances (PFAS). The content in this document describes the intended use, scope and application, personnel qualifications, equipment, cautions, health and safety considerations, procedures, waste management, data recording and management, and quality assurance of PFAS sampling.

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3 Scope and Application

The purpose of this Technical Guidance Instructions (TGI) is to provide guidance on field sampling to be used for **Per- and Polyfluoroalkyl Substances** (PFAS). This protocol was adapted from various sources including Arcadis Australia, Transport Canada, and the U.S Army Corp of Engineers (USACE) Omaha. In general, sampling techniques used for PFAS site characterization are consistent with conventional sampling techniques used in the environmental industry, but special consideration is made regarding PFAS-containing materials and cross-contamination potential. **Table 1a** provides a summary of materials that have been approved for site investigation; this list is expected to grow longer as industry experience increases. **Table 1b** provides a summary of field equipment and materials that have available testing information and/or industry knowledge regarding

PFAS cross-contamination potential, and it is recommended that these materials be prohibited for sample collection; for materials that are suspected of containing PFAS and/or to retain PFAS, these recommendations are considered preliminary and subject to change. Further discussion of approved and prohibited materials is found throughout this document. In general, prohibited materials include but are not limited to peolytetrafluoroethylene (PFTE), waterproof coatings containing PFAS, fluorinated ethylene-propylene (FEP), ethylene tetrafluoroethylene (ETFE), low density polyethylene (LDPE), polyvinylidene fluoride (PVDF) [ITRC 2022].

Table 1a: Summary of Acceptable Sampling Equipment and Materials for PFAS Site Investigations

Sampling Materials	Additional Considerations	References
Water Sampling Materials		
High density polyethylene (HDPE) or silicone tubing materials	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
HDPE HydraSleeves™	LDPE HydraSleeves™ are not recommended	USACE 2016; MassDEP 2017
Drilling and Soil Sampling Materials		
PFAS-free drilling fluids	--	DER 2016
PFAS-free makeup water	Confirm PFAS-free water source via laboratory analysis prior to investigation	--
Acetate liners	For use in soil sampling	USACE 2016
Sample Containers and Storage		
HDPE sample containers with HDPE lined lids for soil and water samples	Laboratory should provide; whole bottle analysis of aqueous samples combined with a solvent rinse of bottle is recommended	DER 2016, MassDEP 2017
Ice contained in plastic (polyethylene) bags (double bagged)	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Field Documentation		
Ball point pens	--	MassDEP 2017
Standard paper and paper labels	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Fine/Ultra-Fine point Sharpies®	Larger point Sharpies® should be avoided.	MDEQ 2018
Decontamination		

Sampling Materials	Additional Considerations	References
Water-only decontamination	Confirm PFAS-free water source via laboratory analysis prior to investigation	DER 2016
Alconox® or Liquinox® followed by deionized water or PFAS-free water rinse	Liquinox® known to contain trace levels of 1,4-dioxane	NHDES 2016; USACE 2016; MassDEP 2017
Sun and Biological Protection		
OFF Deep Woods, Sawyer Permethrin, Insect Shield® Permethrin	Apply >10 m away from sampling area	MDEQ 2018
Banana Boat, Coppertone, Neutrogena, Meijer, and L'Oreal Sunscreens	Apply >10 m away from sampling area	MDEQ 2018

Note: This list is considered preliminary and additional materials may be added as additional information becomes available. Project teams are expected to follow a methodical evaluation process of materials to be used and confirm acceptance prior to implementation of field activities.

Table 1b: Summary of Sampling Equipment and Materials Not Recommended for PFAS Site Investigations.

Sampling Materials	Known PFAS-Containing Materials	Suspected PFAS-Containing Materials	Materials with Potential to Retain PFAS	References
Water Sampling Materials				
Teflon®, PTFE-containing or other fluoropolymer coated or containing field equipment (e.g., tubing, bailers, liners, tape, plumbing paste, pump parts)	x			DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Passive diffusion bags			x	MassDEP 2017
LDPE HydraSleeves ™			x	USACE 2016; MassDEP 2017
Water particle filters			x	MassDEP 2017
Drilling and Soil Sampling Materials				
Aluminium foil			x	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Drilling fluid containing PFAS	x	x		DER 2016
Coated bentonite		x		Radford et al 2023
Pipe thread compounds and tape			x	ITRC 2022

Sampling Materials	Known PFAS-Containing Materials	Suspected PFAS-Containing Materials	Materials with Potential to Retain PFAS	References
Sample Containers and Storage				
Glass sample containers with lined lids			x	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
LDPE containers and lined lids			x	USACE 2016
Teflon® or PTFE- lined lids on containers (e.g., sample containers, rinsate water storage containers)	x			DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Reusable chemical or gel ice packs (e.g., BlueIce®)		x		DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Field Documentation				
Self-sticking notes and similar office products (e.g., 3M Post-it-notes)		x		DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Waterproof paper, notebooks, and labels	x			DER 2016, MassDEP 2017
Markers		x		NHDES 2016
Decontamination				
[Some] detergents and decontamination solutions (e.g., Decon 90® Decontamination Solution)	x	x		DER 2016; NHDES 2016; MassDEP 2017

Note: For materials that are suspected of containing PFAS, or have the potential to retain PFAS, project specific considerations may provide adequate justification for use during the field event. For example, further evaluation may be conducted in the form of pre-field equipment blank sample analysis.

Given the extremely low detection limits associated with PFAS analysis and the many potential sources of trace levels of PFAS, field personnel are advised to err on the side of caution by strictly following these protocols, frequently replacing nitrile gloves, and rinsing field equipment to help mitigate the potential for false detections of PFAS. A summary of other specific items related to field sampling for PFAS are discussed in the sections below.

This TGI applies to all Arcadis and subcontractor personnel involved in field sampling for PFAS.

4 Personnel Qualifications

4.1 Sampling Personnel

Field personnel must have current health and safety training, including 40-hour HAZWOPER training, up to date 8-hour refresher, site supervisor training, and site-specific training, as needed. In addition, field personnel will be versed in the other relevant SOPs (e.g., low flow sampling) and will possess the skills and experience necessary to successfully complete the desired field work. The site Health and Safety Plan (HASP) and other documents will identify any other training requirements such as site-specific safety training or access control requirements.

4.2 Laboratories

These laboratories are example laboratories that could be used to analyze environmental media for PFAS, pending project approval:

- United States: Pace, SGS, Vista, ALS, and Eurofins
- Canada: AXYS-SGS and Bureau Veritas

Other laboratories may be used if they are appropriately accredited for PFAS analysis according to any project requirements. It is recommended that a laboratory is Environmental Laboratory Accreditation Program (ELAP)-accredited for PFAS analysis in accordance with the Department of Defense (DoD) Quality Systems Manual (QSM) 5.3 Table B-15 or any subsequent updates. **For all data collection efforts at DoD sites, PFAS data must be obtained using a method that is DoD ELAP-accredited under QSM 5.3 or later.**

5 Equipment List

The following equipment and materials must be available for sampling:

- Site plan of sampling locations, relevant work plan (or equivalent), and this TGI;
- Appropriate health and safety equipment, as specified in the site HASP;
- Dedicated plastic sheeting (preferably high-density polyethylene [HDPE]) or other clean surface to prevent sample contact with the ground;
- Conductivity/temperature/pH meter;
- Dissolved oxygen meter, oxidation reduction potential meter, and turbidity meter;
- Depth to water meter;
- If using low-flow groundwater sampling techniques, peristaltic pump (groundwater sampling)/bladder pump (with PFAS free bladder/ HDPE bladder), flow through cell, and accompanying HDPE and silicone tubing;
- Hydrasleeves™, if using Hydrasleeves™ for groundwater sampling;
- Metal trowel for soil samples; specialized soil/sediment sampling equipment as required;
- Brushes for scrubbing sampling equipment;

- Pens, pencils, and/or fine/ultra-fine point Sharpies® for writing;
- Clipboards, field binders, and field note pages that are not waterproof;
- Labeled sample bottles:
  - There are various laboratory and analytical methods in place at the time of this TGI revision (Revision 11). Only use certified PFAS free materials provided by the laboratory for sample collection.
- If high concentrations of PFAS related to class B firefighting foams are expected, bring additional small vials to conduct field-based shaker tests for foaming;
- Ziploc® bags to hold ice and samples;
- Bottles containing "PFAS-free" water used for reagent blanks;
- Labeled, thoroughly decontaminated coolers for samples with ice; Blue ice is not permitted;
- Deionized or distilled water for initial decontamination rinsing;
- "PFAS-free" water provided by the laboratory for final decontamination rinsing;
- Alconox or Liquinox®;
- Packing and shipping materials;
- Groundwater and/or Sampling Log; and
- Chain-of-Custody (COC) Forms.

6 Cautions

6.1 Food Packaging

Some food packaging may be treated with PFAS-containing chemicals to prevent permeation of oil and water in the food outside of the packaging. To avoid potential food packaging-related PFAS contact:

- Do not bring any food outside of the field vehicles onsite and eat snacks and meals offsite.
- Wash hands after eating.
- Remove any field garments or outer layers prior to eating. Do not put them back on until done eating and hands are washed.

6.2 Field Gear

6.2.1 Clothing

Many types of clothing are treated with PFAS for stain and water resistance, in particular outdoor performance wear. To avoid potential clothing-related PFAS contact:

- Do not wear any outdoor performance wear that is water or stain resistant, or appears to be. Err on the side of caution.
- Wear pre-laundered (multiple washings, i.e., 6+) clothing that is not stain resistant or waterproof (unless made from the materials listed in Section 5.3.1).
- Natural fabrics such as cotton are preferred. Synthetic fabrics may also be acceptable if there is no indication on the label that the fabric is water and stain resistant.
- Most importantly, avoid contacting your clothing with sampling equipment, bottles, and samples.

6.2.2 Personal Protective Equipment

Safety Footwear

Some safety footwear has been treated to provide a degree of waterproofing and increased durability and may represent a source of trace PFAS. If at all possible, safety footwear without waterproofing should be worn; footwear that provides adequate safety from physical hazards is required and takes precedence over potential PFAS concerns. To avoid any PFAS cross contamination to samples from footwear:

- Do not contact your footwear with equipment, bottles, or samples in any way.
- Do not allow gloves used for sampling to come in contact with safety footwear.

Nitrile Gloves

Wear disposable nitrile gloves at all times. Don a new pair of nitrile gloves **before** the following activities at each sample location:

- Decontamination of re-usable sampling equipment;
- Contact with sample bottles or "PFAS-free" water bottles;
- Insertion of anything into the sample ports (e.g., HDPE tubing); and
- Handling of any quality assurance/quality control (QA/QC) samples including field blanks and equipment blanks.

Don a new pair of nitrile gloves **after** the following activities:

- Handling of any non-dedicated sampling equipment;
- Contact with contaminated surfaces; or
- When judged necessary by field personnel.

6.3 Personal Hygiene

- Shower at night.
- Do not use personal care products after showering such as lotions, makeup, and perfumes, UNLESS medically necessary.

- Use sunscreen and insect repellent as necessary for health and safety, i.e., if sampling is to occur outdoors in direct sunlight and/or if insect hazards may be present. Specific products that are acceptable for PFAS sampling are listed in Table 1 and in Section 6.1. Apply sunscreen and insect repellant prior to initiating field sampling. If sunscreen and/or repellant need to be reapplied, ensure a safe distance away from the sampling locations and equipment (i.e., more than 10 meters (m) away). Wash hands after application and don new gloves following hand washing.

6.4 Visitors

Visitors to the site are asked to remain at least 10 meters from sampling areas.

7 Health and Safety Considerations

7.1 Biological and Environmental Hazard Controls

7.1.1 Sunscreens and Insect Repellents

When site conditions warrant, insect repellent and sunscreen should be applied. Some insect repellents and sunscreen have been approved for PFAS sampling by individual states. According to Michigan Department of Environmental Quality (MDEQ; now known as Michigan Department of Environment, Great Lakes, and Energy [EGLE]), the products below are allowable (MDEQ 2018). Note that California State Water Quality Control Board's PFAS sampling guidance refers to MDEQ/EGLE's allowable list of sunscreens and insect repellents (California State Water Quality Control Board 2020).

Insect Repellents

- OFF Deep Woods
- Sawyer Permethrin

Sunscreen

- Banana Boat Sport Performance Sunscreen Lotion Broad Spectrum SPF 30
- Meijer Sunscreen Lotion Broad Spectrum SPF 30
- Neutrogena Ultra-Sheer Dry-Touch Sunscreen Broad Spectrum SPF 30
- Banana Boat for Men Triple Defense Continuous Spray Sunscreen SPF 30
- Banana Boat Sport Performance Coolzone Broad Spectrum SPF 30
- Banana Boat Sport Performance Sunscreen Lotion Broad Spectrum SPF 30
- Banana Boat Sport Performance Sunscreen Stick SPF 50
- Coppertone Sunscreen Lotion Ultra Guard Broad Spectrum SPF 50
- Coppertone Sport High-Performance AccuSpray Sunscreen SPF 30
- Coppertone Sunscreen Stick Kids SPF 55
- L'Oréal Silky Sheer Face Lotion 50+
- Meijer Clear Zinc Sunscreen Lotion Broad Spectrum SPF 15, 30 and 50
- Meijer Wet Skin Kids Sunscreen Continuous Spray Broad Spectrum SPF 70
- Neutrogena Beach Defense Water + Sun Barrier Lotion SPF 70

- Neutrogena Beach Defense Water + Sun Barrier Spray Broad Spectrum SPF 30
- Neutrogena Pure & Free Baby Sunscreen Broad Spectrum SPF 60+

Please plan for sampling events and purchase these products ahead of time. For any sunscreens and bug sprays, including those listed above, always follow these instructions for application:

- Insect repellents and sunscreen should be applied away from the work area prior to initiating sampling.
- When re-applying, stay at least 10 m away from the sampling locations and equipment.
- Wash hands after application and don new nitrile gloves.

7.1.2 Rain Event

Special care should be taken when rain is falling at the project site:

- Field sampling during extreme rainfall should be avoided if possible. If sampling needs to take place during a rain event (or other extreme weather condition), ensure the rain gear or other safety clothing is appropriate. For example, rain gear made from the following materials is allowable: polyurethane, PVC, wax coated fabrics, rubber/neoprene, uncoated Tyvek® (MDEQ 2018).
- If project timelines are tight, consider the use of a gazebo tent that can be erected over the top of the monitoring well to provide shelter from the rain. The canopy material is possibly a PFAS-treated surface and should be managed as such; therefore, wear gloves when moving the tent, change them immediately after moving the tent, and avoid further contact with the tent until all sampling activities have been finished and the team is ready to move on to the next site.

7.1.3 Other H&S Considerations

- ***If an unapproved or potentially suspect hazard control is needed for health and safety, apply or keep that control away from the samples, document its use in field notes, and, if it does contact a sample, take an equipment blank with that material.***
- The ability to safely access the surface water sampling locations must be verified before sampling.
- Field activities must be performed in accordance with the site HASP, a copy of which will be present onsite during such activities.
- Safety hazards associated with sampling surface water include fast-moving water, deep water, and steep slopes close to sampling sites. Use extreme caution when approaching sampling sites
- If thunder or lighting is present, discontinue sampling and take cover until 30 minutes have passed after the last occurrence of thunder or lighting.
- Use caution when removing well caps as well may be under pressure, cap can dislodge forcefully and cause injury.
- Avoid the use of anti-fog sprays on glasses, which may contain PFAS. It’s recommended to instead purchase pre-treated anti-fog safety glasses.

8 Procedure

8.1 Field Equipment Cleaning

Reusable field sampling equipment will require cleaning before initial use and between uses. For groundwater sampling, between uses, decontaminate the flow-through cell and any non-dedicated equipment (i.e., interface probe of depth to water meter) that comes into contact with well water. Trowels and other materials used to sample soil samples will also require decontamination, although dedicated, single use equipment such as liners should be used where possible.

After donning a new pair of nitrile gloves:

- Rinse sampling equipment with Alconox or Liquinox® cleaning solution; Scrub equipment with a plastic brush if needed;
- Rinse with distilled water or deionized water;
- Rinse with “PFAS-free” water
- Repeat this entire process, scrubbing equipment a second time, rinsing with distilled or deionized water, then rinsing again with “PFAS-free” water (i.e., two scrubbings and four water rinsings total).
- Collect all rinsate in a sealed pail for disposal. Do not reuse decontamination solutions between sampling locations.

8.2 Borehole/Monitoring Well Development

If a drill rig is being used to drill for soil cores or to install monitoring wells, wear clean nitrile gloves before collecting each continuous soil sample. Additional requirements include the following:

- Verify in writing with the manufacturer that single-use liners used to collect each sample are made of a material that does not contain PFAS;
- Collect soil samples in laboratory-supplied HDPE bottles.
- Store the sample bottles in coolers and keep at a temperature of 0 to 6ºC until transported to the laboratory.

8.2.1 Well Condition Survey/ Water Level Monitoring

Using equipment that has been thoroughly decontaminated according to the procedures in Section 7.1, conduct the well condition surveys and water level monitoring:

- Conduct monitoring well inspections and record water levels.
- Use an interface probe to evaluate presence/absence of non-aqueous phase liquid (NAPL).
- Measure the depth to water from the top of the polyvinyl chloride (PVC) riser and the total depth of the well.
- Record information in the field notes.

8.2.2 Monitoring Well Development and Purging

Follow these requirements for monitoring well development and purging:

- Do not use Teflon™ tubing for purging or sample collection. HDPE tubing is acceptable.
- Do not re-use materials between wells. Upon completion of use, remove all disposable materials (such as HDPE and/or silicone tubing) and place in heavy duty garbage bags for disposal.
- During development of the well, create sufficient energy to agitate the water column and create flow reversals in the well screen, filter pack and formation to loosen fine-grained materials and draw them into the well. The pumping or bailing action should then draw all drilling fluids and fine-grained material out of the borehole and adjacent formation and then out of the well. Review the Arcadis Monitoring Well Development guidance (Arcadis 2010) for more detailed information.
- Follow the low-flow purge and sampling techniques per the U.S. Protection Agency's (EPA's) guidance document titled *Low Stress (Low Flow) purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (2010) and ASTM's standard titled *Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations* (2002). Also available for review is the Arcadis Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells (Arcadis 2011).
- To purge the well, if using HDPE tubing and a peristaltic pump, insert the end of the tubing to the approximate depth of the midpoint of the screened section of the monitoring wells. Measure the length of HDPE tubing to be inserted into each monitoring well and pre-cut it to approximate lengths (such as the previously measured arm span of a field technician) to avoid contact with any materials other than the monitoring well and peristaltic pump. Flow rates should be as low as can be reasonably achieved. Collect and appropriately dispose of purge water.
- Silicone tubing should direct the purge water through a flow-through cell for field parameter measurements of pH, conductivity, temperature, dissolved oxygen, and turbidity. Calibrate the instrument in the field prior to use.
- Record field parameters in intervals (generally of 3-minute duration) to ensure purge water has cycled through the flow-through cell. Sample the wells after field parameter measurements indicate stabilization, which allows collection of representative formation water (generally acceptable standards are three consecutive pH readings to within ±0.1 units, and three consecutive conductivity, temperature and dissolved oxygen measurements to within 3%). Turbidity must be monitored, but does not need to be used as a stabilization indicator of purge completion. Record field parameter measurements at each well. Drawdown should be monitored throughout the purge. Prior to collecting sample, disconnect tubing from flow-through cell and collect sample directly from tubing coming out of the monitoring well.
- If wells are suspected to be dewatering throughout the purge (i.e., reduced flow rate/difficulty pumping water or bubbles begin to come through the flow through cell), turn off the pump and allow the water level to recover for ½ hour, followed by sample collection. Document these activities in the field notes.

8.3 Sample Collection

Different laboratories may supply sample collection bottles of varying sizes depending on the type of media to be sampled. This section focuses on the collection of only soil, groundwater, surface water, and sediment. Different media may not follow these procedures. For example, AFFF concentrate should be sampled in accordance with DoD AFFF01 (DoD 2021).

8.3.1 Sample Containers

- Collect samples in HDPE bottles fitted with a HDPE lined (no Teflon™) screw cap.
- Complete bottle labels after the caps have been placed back on each bottle.
- Do not use glass bottles due to potential loss of analyte through adsorption. This is particularly important for aqueous samples.
- Review with analytical lab the sample size, sample container, etc. depending upon the type of PFAS analysis that is being requested.

8.3.2 Soil Sampling

Before Sample Collection

- Place LDPE plastic sheeting adjacent to the sample location for use as a clean work area, if conditions allow. Otherwise, prevent sampling equipment from contacting the ground or other surface that could compromise sample integrity.
- Trowels or drilling equipment that will come into contact with a sample should be decontaminated prior to sample collection, preferably with methanol/isopropanol/acetone;
- Don a new set of nitrile gloves. Do not use gloved hands to subsequently handle papers, pens, clothes, etc., before collecting samples.
- Use the HDPE bottles that are supplied by the laboratory. Make sure that the caps remain on the bottle until immediately prior to sample collection.

During Sample Collection

- Collect soil samples using a clean stainless-steel trowel or with single-use PFAS-free liners;
- Place soil samples in HDPE bottles supplied by the laboratory.
- Note the time on the sample label.
- Collect any necessary duplicates/co-located samples and matrix spikes – verify with laboratory whether they need to be collected in separate sample bottles.
- Collect any necessary equipment blanks. The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFAS, after the sampling equipment has been appropriately decontaminated.

- Collect any necessary field reagent blanks. This sample should be collected after field staff return from an offsite break (e.g., lunch) to capture any potential cross-contamination from field personnel.

After Sample Collection

- Place each sample bottle in two sealed Ziploc® bags. Another brand of LDPE bag is acceptable.
- Record the label information and time of sampling in the field notes.
- Place soil sample bottles in coolers that are durable in transportation and keep the temperature between 0 and 6ºC until transported to the laboratory. Do not use blue ice.

8.3.3 Groundwater Sampling

Before Sample Collection

- Place LDPE plastic sheeting adjacent to the sample location for use as a clean work area, if conditions allow. Otherwise, prevent sampling equipment from contacting the ground or other surface that could compromise sample integrity.
- Don a new set of nitrile gloves. Do not use gloved hands to subsequently handle papers, pens, clothes, etc., before collecting samples.
- Use the HDPEbottles that are supplied by the laboratory. Make sure that the caps remain on the bottle until immediately prior to sample collection.
- Measure depth to water and field parameters. Turbidity and the physical appearance of the purged water should be noted on the Groundwater Sampling Log.

During Sample Collection

- Start groundwater sample collection upon stabilization of field parameters.
- If low-flow groundwater sampling techniques are being used, disconnect the silicone tubing from the flow-through cell, enabling collection of groundwater samples without passing through the cell.
- Hydrasleeves are also considered acceptable for sampling of PFAS in groundwater – consult the project manager to determine which technique should be used. In general, low flow sampling is preferable.
- Collect groundwater samples (to the neck of the bottle, some headspace is acceptable) from the dedicated sampling ports at the center of the well screen. While collecting the sample, make sure the bottle cap remains in the other hand of the sampler, until replaced on the bottle.
- To mitigate cross contamination, collect groundwater samples in a pre-determined order from least impacted to greater impacted based on previous analytical data or knowledge about past activities at the site. If no analytical data are available, samples are to be collected in the following order:
  1. First sample the upgradient well(s).
  2. Next, sample the well located furthest downgradient of the interpreted or known source.
  3. The remaining wells should be progressively sampled in order from downgradient to upgradient, such that the wells closest to the interpreted or known source are sampled last.

- NOTE: If high concentrations of PFAS related to class B firefighting foams are expected in a groundwater sample, conduct a Shaker test by collecting and shaking a small portion of the sample (~10 to 25 mL) on site in a small disposable vial. If foaming is noted within the sample, document the foaming when samples are submitted for analysis; the 'shaker test' vial can then be disposed. This shaker test provides information about how each of the samples should be handled analytically.
- After collecting the sample, tightly screw on the polypropylene cap (snug, but not too tight). This will minimize leaking or cross contamination of the sample.
- Note the time on the sample label.
- Collect any necessary duplicates and matrix spikes. As the laboratory should be analyzing the entire aqueous sample rather than sub-sampling, separate bottles will be required for these samples.
- Collect any necessary equipment blanks. The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFAS, after the sampling equipment has been appropriately decontaminated.
- Collect any necessary field reagent blanks. This sample should be collected after field staff return from an offsite break (e.g., lunch) to capture any potential cross-contamination from field personnel.
- Do not rinse PFAS sample bottles during sampling. Do not filter samples.

After Sample Collection

- Place each sample bottle in two sealed Ziploc® bags. Another brand of LDPE bag is acceptable.
- Record the label information and time of sampling in the field notes and COC. Note 'shake test' results if appropriate.
- Place groundwater samples in coolers that are durable in transportation and keep the temperature between 0 and 6ºC until transported to the laboratory. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**

  Treat all disposable sampling materials as single use and dispose of them appropriately after sampling at each monitoring well.

8.3.4 Surface Water Sampling

Before Sample Collection

- Place LDPE plastic sheeting adjacent to the sample location for use as a clean work area, if conditions allow. Otherwise, prevent sampling equipment from contacting the ground or other surface that could compromise sample integrity.
- Don a new set of nitrile gloves. Do not use gloved hands to subsequently handle papers, pens, clothes, etc., before collecting samples.
- Use the HDPE bottles that are supplied by the laboratory. Make sure that the caps remain on the bottle until immediately prior to sample collection.

During Sample Collection

- Avoid sampling the surface, in general.
- However, for Air Force investigations, collect samples from the water surface.
- Where surface water samples and sediment samples are collected at the same location, collect surface water samples first to minimize siltation.
- Collect surface water samples directly into laboratory-supplied bottles; wide-mouth bottles may be preferable to narrow mouth bottles for ease of surface water collection.
- Make sure bottle caps remain in the gloved hand of the sampler until sampling is complete and caps are replaced on the bottle.
- Note the time on the sample bottle.
- Collect any necessary duplicates and matrix spikes. As the laboratory should be analyzing the entire aqueous sample rather than sub-sampling, separate bottles will be required for these samples.
- Collect any necessary equipment blanks. The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFAS, after the sampling equipment has been appropriately decontaminated.
- Collect any necessary field reagent blanks. This sample should be collected after field staff return from an offsite break (e.g., lunch) to capture any potential cross-contamination from field personnel.

After Sample Collection

- Place each sample bottle in two sealed Ziploc® bags. Another brand of LDPE bag is acceptable.
- Record the label information and time of sampling in the field notes.
- Place samples in coolers that are durable in transportation and keep the temperature between 0 and 6ºC until transported to the laboratory. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**
- Measure surface water pH, conductivity, temperature, and TDS at each location **after** both surface water and sediment sampling.

8.3.5 Sediment Sampling

Before Sample Collection

- Place LDPE plastic sheeting adjacent to the sample location for use as a clean work area, if conditions allow. Otherwise, prevent sampling equipment from contacting the ground or other surface that could compromise sample integrity.
- Don a new set of nitrile gloves. Do not use gloved hands to subsequently handle papers, pens, clothes, etc., before collecting samples.
- Use the HDPE bottles that are supplied by the laboratory. Make sure that the caps remain on the bottle until immediately prior to sample collection.

During Sample Collection

- Where surface water samples and sediment samples are collected at the same location, collect surface water samples first to minimize siltation.
- Collect sediment samples either manually using a stainless-steel trowel or using a petite ponar grab sampler, depending on field conditions at each sampling location during sampling program.
- Collect sediment samples from the upper 10 cm of sediment.
- For a sample to be acceptable overlying, low turbidity water must be present.
- Decant the overlying water and use a stainless-steel trowel to collect only the upper 5 centimeters (cm) of sediment.
- Collect sediment samples directly into laboratory-supplied bottles that are suitable in both material and size.
- Do not overfill the sample bottle.
- Make sure that the sample does not contain vegetation, that the sediment is undisturbed, and that the sampler shows no signs of winnowing or leaking.
- Make sure bottle caps remain in the gloved hand of the sampler until sampling is complete and caps are replaced on the bottle.
- Note the time on the sample label.
- Collect any necessary duplicates and matrix spikes.
- Collect any necessary equipment blanks. The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFAS, after the sampling equipment has been appropriately decontaminated.
- Collect any necessary field reagent blanks. This sample should be collected after field staff return from an offsite break (e.g., lunch) to capture any potential cross-contamination from field personnel.

After Sample Collection

- Place each sample bottle in two sealed Ziploc® bags. Another brand of LDPE bag is acceptable.
- Record the label information and time of sampling in the field notes.
- Place samples in coolers that are durable in transportation and keep the temperature between 0 and 6ºC until transported to the laboratory. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**
- Measure surface water pH, conductivity, temperature, and total dissolved solids (TDS) at each location **after** both surface water and sediment sampling is completed.

8.4 Shipping

- If samples cannot be shipped the same day as collected, arrange an appropriate means of keeping the samples cool overnight and maintain the temperature between 0 and 10°C for the first 48 hours after collection, and then between 0 and 6°C thereafter.

- Store samples in appropriate transport bottles (coolers) with ice (Ziploc© bags for use as ice containers) with appropriate labeling. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**
- Complete the appropriate procedures for COC, handling, packing, and shipping.
- Fill out and check COC Forms against the labels on the sample bottles progressively after each sample is collected.
- Place all disposable sampling materials (such as plastic sheeting, and health and safety equipment) in appropriate containers.
- Ship samples via courier service with priority overnight delivery. Tracking numbers for all shipments should be provided and recorded after they have been sent out to ensure their timely delivery.
- Confirm with the laboratory before shipping samples via Fed Ex for Saturday delivery.

9 Waste Management

All rinsate should be collected in a sealed pail for disposal. Drill cuttings and purge water will be managed as specified in the Field Sampling Plan (FSP) or Work Plan, and according to state and/or federal requirements. PPE and decontaminated fluids will be contained separately and staged at the sampling location. Containers must be labeled at the time of collection. Labels will include date, location(s), site name, city, state, and description of matrix contained (e.g., soil, groundwater, PPE). General guidelines for investigation derived waste (IDW) handling and storage are set forth in a separate IDW guidance document (Arcadis 2009).

Typical waste characterization procedures include collection of a composite sample of the drill cutting material and a composite sample of the purge water for laboratory analysis. Samples are typically analyzed for disposal toxicity characteristic leaching procedure (TCLP) analysis for metals and VOCs. For PFAS, a simple leach test with neutral pH water may be more indicative of actual risk. Additionally, generators of waste are required to include analysis of other constituents that are reasonably believed to be present including (in this case) PFAS.

Waste storage and final waste disposition should be determined in the site specific workplan.

10 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

If digital data collection isn't possible, waterproof field books should be avoided for field notes. Instead, field notes on loose paper on Masonite, plastic, or aluminum clip boards is preferred. Please note that newer Rite in the Rain® notebooks are approved for PFAS sampling. Other requirements for field notes include:

- Pens, pencils, and fine/ultra-fine point Sharpies® may be used.
- Keep field notes and writing implements away from samples and sampling materials.
- One person should conduct sampling while another records field notes.
- Do not write on sampling bottles unless they are closed.

10.1 Other Project Documentation

- Complete groundwater and/or soil sampling logs.
- Make sure COC Forms are properly completed. Verify which PFAS analytes and methods (e.g., just PFOS/PFOA, some or all of the /1633 lists, etc.) are required for analysis and note on the COC.

11 Quality Assurance

Refer to quality control requirements for the project to ensure that appropriate quality assurance and quality control (QA/QC) samples are collected. When collecting QA/QC samples, the same guidelines apply as when collecting regular samples – specifically that:

- Samples should be collected in laboratory-supplied HDPE bottles;
- Bottle caps must remain in the hand of the sampler until replaced on the bottle;
- Labels must be completed after the caps have been placed back on each bottle; and
- Samples must be stored in appropriate transport bottles (coolers) with ice (Ziploc© bags for use as ice containers) with appropriate labeling. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**

11.1 Equipment Blanks (if relevant)

QA/QC sampling typically includes daily collection of equipment blanks using the laboratory-supplied "PFAS-free" water. For peristaltic pump tubing, laboratory supplied "PFAS-free" water should be poured into a clean HDPE sample bottle and then pumped through new HDPE tubing using the peristaltic pump (with new silicone tubing). The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFAS, after the sampling equipment has been appropriately decontaminated. Note that an equipment blank can also be collected if an unapproved or potentially suspect hazard control is needed for health and safety and it contacts a sample, i.e., that material would be exposed to PFAS free water then the water would be collected in a separate sample container.

11.2 Field Duplicates

QA/QC sampling typically includes the collection of one field duplicate for every 10 or 20 samples collected. Each duplicate sample will be collected immediately after the initial sample of which it is a duplicate into a separate laboratory-provided sample bottle. Do not indicate to the laboratory which sample the duplicate replicates, i.e., it should be given a blind reference on the COC and sample name such as "Duplicate-01".

11.3 Field Reagent Blanks

QA/QC sampling for PFAS typically includes the submission of one laboratory supplied field reagent blank per day. The field reagent blank sample is brought to the site in a laboratory-supplied sample bottle. Field staff transfer the laboratory-supplied reagent blank to an empty sample bottle. This sample should be collected after field staff return from an offsite break (e.g., lunch) to capture any potential cross-contamination from field personnel and should be placed in the same cooler as the other PFAS samples.

11.4 Matrix Spikes (optional in some cases)

QA/QC sampling includes submitting samples to be used as a matrix spike and matrix spike duplicate (MS/MSD) if the project requires it. If separate sample bottles are required, additional samples will be collected immediately after the initial sample of which it is a duplicate into separate laboratory-supplied sample bottles.

11.5 Laboratory Analytical QA/QC

- Arcadis recommends that any request for PFAS analysis in groundwater or soil should be conducted by an ELAP-accredited method compliant with QSM 5.3 Table B-15. Requirements laid out in Table B-15 strictly govern acceptable laboratory data quality for PFAS analysis in environmental samples. **For all data collection efforts at DoD sites, PFAS data must be obtained using a method that is DoD ELAP-accredited under QSM 5.3 or later.**
- Laboratory QA/QC should consist of one laboratory blank and one laboratory control sample (or blank spike) per batch of samples, and additional QA/QCs as indicated by the laboratory QA/QC procedures.
- Isotope dilution must be used for quantification with isotope-labeled spiked standards (extracted internal standards EIS), as available, according to the guidelines of QSM 5.3 Table B-15. See EPA method 1633 and DoD QSM 5.4 Table B-24 for quantification requirements by isotope dilution with EIS standards. The USEPA has two drinking water methods (USEPA Method 537.1 and USEPA Method 533).
- For drinking water, groundwater, and surface water samples, laboratories must extract the entire sample and include a solvent rinse of the bottle for analysis. Aqueous samples should generally not be sub-sampled prior to analysis, unless they are high concentration and require serial dilution (US DoD 2017).
- Soil samples should be analyzed in their entirety or thoroughly homogenized before extraction and analysis.
- As part of the internal QA/QC of laboratory results, relative percent difference (RPD) should be calculated between samples and corresponding field or laboratory duplicates. The laboratory quality assurance portion of the laboratory certificates should be reviewed to verify that all calculations/recoveries were within acceptable limits as established by the laboratory method and guidelines in Table B-15 of QSM 5.3 or later (USDoD 2019).

12 References

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Arcadis. 2010. Monitoring Well Development, Rev. #2.2. March 22.

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TGI – Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells

Rev: 3

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Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	October 12, 2018	All	Updated and re-written as TGI with new branding and content	Marc Killingstad
	1	May 8, 2020	Pages 5, 10-11	Added clarification/details for equipment requirements and procedure steps based on USEPA guidance	Marc Killingstad
	2	April 5, 2022	All	Updated to new branding template and minor edits	Marc Killingstad
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Approval Signatures

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Xuan Xu (Preparer) Date

Reviewed by: 4/5/2023

Marc Killingstad (Subject Matter Expert) Date

1 Introduction

Groundwater samples are collected from monitoring wells to evaluate groundwater quality. The protocol presented in this Technical Guidance Instruction (TGI) describes the procedures to purge monitoring wells and collect groundwater samples using the low flow purging/sampling methodology. This protocol has been developed in accordance with the United States Environmental Protection Agency (USEPA) Region I *Low Stress (Low Flow) Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells* (EQASOP-GW4; September 19, 2017).

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

Both filtered and unfiltered groundwater samples may be collected using this low-flow sampling method. Filtered samples will be obtained using a 0.45-micron disposable filter. Project teams will evaluate the last time the monitoring wells were developed and determine if additional development might be necessary. Water samples will not be taken immediately following well development. Sufficient time will be allowed for the groundwater flow regime in the vicinity of the monitoring well to stabilize and to approach chemical equilibrium with the well construction materials. This lag time will depend on site conditions and methods of installation but often exceeds one week.

4 Personnel Qualifications

Arcadis field sampling personnel will have completed or are in the process of completing site-specific training as well as having current health and safety training as required by Arcadis, client, or regulations,such as 40-hour HAZWOPER training and/or OSHA HAZWOPER site supervisor training. Arcadis personnel will also have current training as identified in the site-specific Health and Safety Plan (HASP) which may include first aid, cardiopulmonary resuscitation (CPR), Blood Borne Pathogens (BBP) as needed. The HASP will also identify any access control requirements.

Prior to mobilizing to the field, the groundwater sampling team will review and be thoroughly familiar withrelevant site-specific documents including but not limited to the task-specific work plan or field implementation plan (FIP)/field sampling plan, Quality Assurance Project Plan (QAPP), HASP, historical information, and other relevant site documents.

Arcadis field sampling personnel will be knowledgeable in the relevant processes, procedures, and TGIs and possess the demonstrated required skills and experience necessary to successfully complete the desired field work. Additionally, the groundwater sampling team will review and be thoroughly familiar with documentation provided by equipment manufacturers and become familiar with the operation of (i.e., hands-on experience) all equipment that will be used in the field prior to mobilization.

5 Equipment List

Specific to this activity, the following materials (or equivalent) will be used:

- Site-specific HASP and health and safety documents identified in the HASP
- Field Implementation Plan (FIP) that includes site map, well construction records, sampling plan (sample analyses, sample volume required, and sample holding time), and prior groundwater sampling records (if available)
- Field notebook and/or smart device (phone or tablet)
- Low-flow sampling field forms (**Attachment A**)
- Appropriate personal protective equipment (PPE) (e.g., latex or nitrile gloves, safety glasses, etc.)as specified in the HASP
- Well keys and other tools to remove manhole covers (manual torque wrench with 9/16” socket and flat head screwdriver typical)
- Photoionization detector (PID) or Flame ionization detector (FID) (as appropriate, depending onsite-specific constituents of concern)
- Electronic water-level indicator (e.g., Solinist Model 101) or oil/water interface probe with 0.01- foot accuracy (oil/water as appropriate, note that sampling will not be performed when sheen orlight non-aqueous phase liquid [LNAPL] is present)
- Down-hole multi-parameter water-quality sonde (temperature/pH/specific conductivity/oxidationreduction [ORP]/turbidity/dissolved oxygen) meter coupled with flow-through-cell for measurements, for example:

  - YSI 6-Series Multi-Parameter Instrument
  - Horiba U-22 Multi-Parameter Instrument.
  - Hydrolab Series 3 or Series 4a Multiprobe and Display.

  NOTE: *Transparent, small volume flow-through-cells (e.g., 250 milliliters or less) are preferred as they allow for easy detection of air bubbles and sediment buildup in the cell, which can interfere with the monitoring instrument probes. A small volume cell also allows for quick turnover of water in the cell between measurements of the indicator field parameters. It is recommended to use a flow-through-cell and monitoring probes from the same manufacturer and model to avoid incompatibility between the probes and flow-through-cell.*

- Plastic sheeting (e.g., Weatherall Visqueen) to protect all down-hole sampling equipment from contact with potential sources of contamination.
- Decontamination equipment
  - Non-phosphate laboratory soap (Alconox or equivalent), brushes, and clean buckets, and/or clean wash tubs—new buckets or tubs will be purchased if it cannot be determined if the present items are clean
  - Distilled or de-ionized water for equipment decontamination
- Indelible ink pen
- 150-foot measuring tape (or sufficient length for the maximum site depth requirement)
- Sampling pump, which may consist of one or more of the following:
  - Submersible pump (e.g., Grundfos Redi-Flo 2)
  - Peristaltic pump (e.g., ISCO Model 150)
  - Bladder pump (e.g., Marschalk System 1, QED Micropurge, Geotech)
- Appropriate controller and power source for pump:
  - Submersible and peristaltic pumps require electric power from either a generator or a deep cell battery
  - Submersible pumps such as Grundfos require a pump controller to run the pump
  - Bladder pumps require a pump controller and a gas source (e.g., air compressor or compressed N_2 or CO_2 gas cylinders)
- Teflon® tubing or Teflon®-lined polyethylene tubing of an appropriate size for the pump being used
  - For peristaltic pumps, dedicated Tygon® tubing (or other type as specified by the manufacturer) will be used through the pump apparatus
  - Teflon® will not be used when sampling for per- and polyfluoroalkyl substances (PFAS)
- Graduated cylinder and stopwatch or other device to measure time to determine pumping rate
- Appropriate water sample containers (supplied by the laboratory)
- Appropriate blanks (trip blank supplied by the laboratory)
- Sample labels and Chain-of-Custody forms (COC)
- 0.45-micron disposable filters (if field filtering is required)

- A supplemental turbidity meter (e.g., Horiba U-10, Hach 2100P, LaMotte 2020) may be required for specific projects and will be specified in the project FIP/ work plan and the kick-off notes.
    - If used, in-line 'T' and valve allows for collection of water for turbidity measurements before the pump discharge enters the flow-through cell

NOTE: *The maintenance requirements for the above equipment generally involve decontamination or periodic cleaning, battery charging, and proper storage, as specified by the manufacturer. For operational difficulties, the equipment will be serviced by a qualified technician.*

6 Cautions

Different USEPA regions and/or state regulatory agencies may stipulate deviations from this document. Itis the responsibility of the Project Team (Project Manager and Technical Lead) to be fully aware of the requirements from the applicable regulatory framework.

Weather

- If heavy precipitation occurs, and no cover over the sampling area and monitoring well can be erected, sampling may be discontinued until adequate cover is provided. Rainwater could compromise groundwater samples.
- Avoid extreme weather situations. Be aware that thermal currents and vertical mixing of cold and warm water inside the well casing could create a convection cell within the well and compromise data collection (e.g., biological mechanisms).
    - Direct sunlight and hot ambient temperatures may cause the groundwater in the tubing orflow-through-cell to heat up and de-gas. This may result in the loss of volatile organic compounds (VOCs) and dissolved gases. Shade the equipment from direct sunlight, keep the tubing as short as possible and avoid the hottest times of the day.
    - Sampling during freezing conditions may adversely impact the data quality objectives. USEPA recommends low-flow sampling be conducted at air temperatures above 32°F (0°C) or taking special precautions to prevent groundwater from freezing in the equipment.

Cross-Contamination

- To mitigate potential cross-contamination, groundwater samples are to be collected in a pre- determined order from least impacted to impacted based on previous analytical data. If no analytical data are available, collect samples in order of up-gradient, then furthest down-gradient tosource area locations.
- Note that permanent markers could introduce volatile constituents into the samples*; therefore, indelible ink is recommended* to be used for labels on sample containers or sample coolers.
- When using a gasoline generator, this power source will be set-up at least 30 feet downwind from the well to avoid exhaust fumes to contaminate samples.

Pumps

- Preferred methods of extracting groundwater are adjustable rate, submersible pumps - such as centrifugal pumps or bladder pumps – constructed of stainless steel or polytetrafluoroethylene (PTFE, i.e., Teflon®). However, *PTFE will not be used when sampling for per- and polyfluoroalkyl substances (PFAS). PTFE could contain PFAS*.

- When using a bladder pump for collecting VOCs and dissolved gases, "best practice" is to set-up the pump to deliver sufficient water to fill a 40 mL VOC vial.
- The use of peristaltic pumps will be based on the type of data to be collected. *Because the use a peristaltic pump can result in de-gassing of VOC and / or dissolved gases from groundwater, a different type of pump will be considered if these compounds are of concern.*
- *Manual or motor driven inertial pumping devices are not recommended because they cause greater disturbance during purging and pumping than regular pumps and are less easily controlled. This could cause a higher degree of data variability.*

Tubing

- When sampling for VOCs, SVOCs, pesticides, PCBs and inorganics, use of PTFE (Teflon®) or PTFE-lined tubing is preferred. However, PTFE tubing will not be used when sampling for PFAS.
- PVC, polypropylene or polyethelene tubing may be used when sampling for metals or other inorganics.
- Tubing with inside diameters of 1/4 or 3/8 inch is recommended because this will help ensure tubing remains water filled when operating at very low pumping rates.

General Precautions

- Store and/or stage empty and full sample containers and coolers out of direct sunlight.
- It may be necessary to field filter the groundwater for some parameters (e.g., metals) during collection, depending on preservation, analytical method, and project quality objectives. The task-kick-off notes and the FIP/work plan will list the samples that require field filtering.
- Be careful not to overtighten lids with Teflon® liners or septa (e.g., 40 mL vials). Over-tightening can cause the glass to shatter or impair the integrity of the Teflon® seal.

7 Health and Safety Considerations

The HASP will be followed, as appropriate, to ensure the safety of field personnel.

Appropriate personal protective equipment (PPE) will be always worn in line with the task and the site-specific HASP.

Review all site-specific and procedural hazards as they are provided in the HASP, and review Job Safety Analysis (JSA) documents in the field each day prior to beginning work.

Access to wells may expose field personnel to hazardous materials such as contaminated groundwater or non-aqueous phase liquid (NAPL) (e.g., oil). Other potential hazards include pressurized wells, stinging insects that may inhabit well heads, other biologic hazards (e.g. ticks in long grass/weeds around well head), and potentially the use of sharp cutting tools (scissors, knife)—open well caps slowly and keep face and body away to allow to vent any built-up pressure; only use non-toxic peppermint oil spray for stinging insect nests; review client-specific health and safety requirements, which may preclude the use of fixed/folding-blade knives, and use appropriate hand protection.

Generators and cord and plug equipment will employ an overcurrent protection device such as an integrated ground fault circuit interrupter (GFCI) cord. Grundfos pump controllers will not run properly with a GFCI, so the power source will be equipped with other overcurrent protection means.

Overtightening of lids with Teflon® liners can cause the glass to shatter and create a risk for hand injuries.

8 Procedure

Field personnel will set up and perform low-flow sampling in accordance with the following procedures.

1. Review FIP and groundwater sampling records from previous sampling events (if available) prior to mobilization to estimate the optimum pumping rate and anticipated drawdown for each well to perform sampling as efficiently as possible (i.e., reach a stabilized pumping condition).
2. Calibrate field instruments according to manufacturer procedures for calibration and record calibration procedure and results in field log.
3. All equipment will either be new or decontaminated in accordance with appropriate guidance document *(TGI – Groundwater and Soil Sampling Equipment Decontamination)* prior to use.
4. Visually inspect the well to ensure that it is undamaged, properly labeled and secured
   a. Damage or other conditions that may affect the integrity of the well will be recorded in the Field Activity Daily Log and brought to the attention of the designated Field Manager and/or Project Manager
   b. Record well construction and conditions on the Low-Flow Sampling Field Form **(Attachment A)**.
5. Place clean plastic sheeting on the ground near the well to keep monitoring and sampling equipment off the surface unless the equipment is elevated above the ground (e.g., on a table).
6. Open the well cover while standing upwind of the well. Remove the well cap and place it on the plastic sheeting. If appropriate or required for site-specific conditions, insert the photoionization detector (PID) probe approximately 4 to 6 inches into the casing or the well headspace and cover it with a gloved hand. Record the PID reading in the field log. Perform air monitoring in the breathing zone according to the HASP and/or JSA.
7. Measure and record the initial depth to groundwater prior to placing the pumps.
8. Prepare and install the pump in the well.

   NOTE: *Groundwater will be purged from the wells using an appropriate pump. If the depth to water is below the sampling range of a peristaltic pump (approximately 25 feet below ground surface), a submersible or bladder pump will be used, provided that the well is constructed with a casing diameter of at least two (2) inches (the minimum well diameter capable of accommodating such pumps). For smaller diameter wells, where the depth to water is below the sampling range of a peristaltic pump, alternative sampling methods (i.e., bailing or small diameter bladder pumps) will be used to purge and sample the groundwater. Bladder pumps are preferred over peristaltic and submersible pumps to prevent volatilization if sampling of VOCs and/or dissolved gasses is required. Purge water will be collected and containerized according to the direction of the project team.*

   a. For submersible and non-dedicated bladder pumps, decontaminate the pump according to site decontamination procedures. Non-dedicated bladder pumps will require a new bladder and attachment of an air-line, sample discharge line, and safety cable prior to placement in the well. Attach the air-line tubing to the air-port on the top of the bladder pump. Attach the sample discharge tubing to the water port on the top of the bladder pump. Take care not to reverse the air and discharge tubing lines during bladder pump setup, as this could result in bladder failure or rupture. Attach and secure a safety cable to the eyebolt on the top of pump (if present, depending on pump model used). Slowly lower the pump, safety cable, tubing, and electrical lines into the well to a depth corresponding to the approximate center of the saturated screen section of the well. Avoid twisting and tangling of safety cable, tubing, and electrical lines while lowering the pump into the well; twisted and tangled lines could result in the pump becoming stuck in the well casing. Also, make sure to keep tubing and lines from touching the ground or other surfaces while introducing them into the well, as this could lead to unintended contamination.

b. If using a bladder pump, connect the air-line to the pump controller output port. The pump controller will be connected to a supply line from an air compressor or compressed gas cylinder using an appropriate regulator and air hose. Tighten the regulator connector onto the gas cylinder (if used) to prevent leaks. Teflon® tape may be used on the threads of the cylinder to provide a tighter seal. Once the air compressor or gas cylinder is connected to the pump controller, turn on the compressor or open the valve on the cylinder to begin the gas flow. Turn on the pump controller power (if an on/off switch is present) and verify that all batteries are charged and fully functioning before starting the pump.

c. If a peristaltic pump is being used, slowly lower the sampling tubing into the well to a depth corresponding to the approximate center of the saturated screen section of the well. The pump intake or sampling tube must be kept at least two (2) feet above the bottom of the well to prevent mobilization of any sediment present in the bottom of the well.

d. If using an in-line 'T' and valve, install between pump discharge water line and the bottom inlet port of the flow-through cell. Attach a short piece of tubing to the outlet. This set-up will be used to collect samples for turbidity readings.

9. Connect the pump discharge water line to the bottom inlet port on the flow-through cell connected to the multi-parameter water-quality sonde and make sure to record equipment/instrument identification (manufacturer and model number).

10. Before starting the pump, ensure that the water level inside the well has stabilized (i.e., measure the water level multiple times after deploying the pump in the well).

11. Start pumping the well at 200 to 500 milliliters (mL) per minute (or at lower site-specific rate if specified) and adjust the pumping rate to cause little or no water level drawdown in the well (less than 0.3 feet below the initial static depth to water measurement): the water level should stabilize, however, this is not always possible.

12. If the well diameter is of sufficient size, measure the water level every 3 to 5 minutes (or as appropriate, lower flow rates may require longer time between readings) during pumping.

13. Maintain a steady flow rate to the extent practicable and do not break pump suction or cause entrainment of air in the sample.

14. Record pumping rate adjustments and depths to water.

    If necessary, reduce pumping rates to the minimum capabilities of the pump to avoid pumping the well dry and/or to stabilize indicator parameters; if the recharge rate of the well is very low, use alternative purging techniques, which will vary based on the well construction and screen position.

    For wells screened across the water table, the well may be pumped dry, and sampling can commence as soon as the volume in the well has recovered sufficiently to permit collection of samples.

    For wells screened entirely below the water table, the well can be pumped until a stabilized level (which may be greater than the maximum displacement goal of 0.3 feet) is maintained and monitoring for stabilization of field indicator parameters can commence; if a lower stabilization level cannot be maintained, the well may be pumped until the drawdown is at a level slightly higher than top of the well screen.

15. After water levels have stabilized and a sufficient volume has been purged (see note below), continue pumping and begin monitoring field indicator parameters using a multi-parameter water-quality sonde coupled with a flow-through-cell.

    NOTE: *The final purge volume must be greater than the stabilized drawdown volume plus the pump's tubing volume. If the drawdown has exceeded 0.3 feet and stabilizes, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are collected.*

16. Use the flow to measure all indicator field parameters, except for turbidity, every 3 to 5 minutes (or after each volume of the flow-through cell has been purged or other appropriate interval); turbidity samples will be collected before the flow-through-cell using the T-valve and a clean container such as a glass beaker.

17. Record field indicator parameters on the groundwater sampling log.

18. The well is considered stabilized and ready for sample collection when three consecutive readings are within the following limits:

    - **Turbidity** within ± 10% for values greater than 5 nephelometric turbidity units [NTUs] or if three turbidity values are less than 5 NTUs, consider the values stabilized
    - **Dissolved Oxygen (DO)** within ± 10% for values greater than 0.5 mg/L or if three DO values are less than 0.5 mg/L, consider the values stabilized
    - **Specific Conductance** within ± 3%
    - **Temperature** within ± 3%
    - **pH** within ± 0.1 unit
    - **Oxidation/Reduction Potential (ORP)** within ±10 millivolts (mV)

    NOTE: *Alternate stabilization goals may exist in different geographic regions, consult the site- specific FIP/work plan for stabilization criteria).*

    NOTE: *While achieving turbidity levels less than 5 NTU and a stable drawdown of less than 0.3 feet is desirable, sample collection may still take place provided the indicator field parameter criteria in this procedure are met.*

19. If the parameters have stabilized but turbidity remains relatively high (e.g., greater than 50 NTUs), the pump flow rate may be decreased to a minimum rate of 100 mL/min to reduce turbidity levels as low as possible. If groundwater turbidity has been minimized (i.e., consecutive readings within ± 10%) and the values for all other parameters have stabilized, the well may be sampled; however, consult specifications in the FIP/work plan and/or the project technical lead prior to sampling.

20. If after one (1) hour of purging indicator field parameters have not stabilized, consult specifications in the FIP/work plan and/or the project technical lead prior to sampling.

    In general, three potential options are available if stabilization criteria are not met:

    a. Continue purging until stabilization is achieved.
    b. Discontinue purging, do not collect any samples, and record in field logbook/on the sampling form that stabilization could not be achieved (documentation must describe attempts to achieve stabilization).

c. Discontinue purging, collect samples, and provide full explanation of attempts to achieve stabilization. There is a risk that the analytical data obtained under these conditions, particularly metals and hydrophobic organic analytes, may reflect a sampling bias and, as a result, the data may not meet the data quality objectives of the sampling event.

NOTE: *DO is extremely susceptible to various external influences (including temperature or the presence of bubbles on the DO meter); therefore, great care will be taken to minimize the agitation or other disturbance of water within the flow-through cell while collecting these measurements. If air bubbles are present on the DO probe or in the discharge tubing, remove them before taking a measurement. If DO values are not within acceptable range for the temperature of groundwater, again check for and remove air bubbles on the probe before re-measuring. The table below may be used as a general guide for DO values under various temperatures; however, understand that the table corresponds to freshwater solubility and groundwater contaminants may affect oxygen solubility. If DO value is 0.00 or less, then the meter will be serviced and re-calibrated. If DO values are above possible results, then the meter will be serviced and re-calibrated.*

NOTE: *During extreme weather conditions, stabilization of field indicator parameters may be difficult to attain. Modifications to the sampling procedures to alleviate these conditions (e.g., measuring the water temperature in the well adjacent to the pump intake) will be documented in the field logbook/on the sampling form.*

NOTE: *If other field conditions are suspected of preventing stabilization of certain parameters, detailed observations will be documented in the field logbook/on the sampling form.*

Oxygen Solubility in Fresh Water

Temperature (degrees C)	Dissolved Oxygen (mg/L)
0	14.6
1	14.19
2	13.81
3	13.44
4	13.09
5	12.75
6	12.43
7	12.12
8	11.83
9	11.55
10	11.27
11	11.01
12	10.76
13	10.52
14	10.29
15	10.07
16	9.85
17	9.65
18	9.45
19	9.26
20	9.07
21	8.9
22	8.72
23	8.56
24	8.4
25	8.24
26	8.09
27	7.95
28	7.81
29	7.67
30	7.54
31	7.41
32	7.28
33	7.16
34	7.05
35	6.93

Reference: Vesilind, P.A., Introduction to Environmental Engineering, PWS Publishing Company, Boston, 468 pages (1996)

21. Complete the sample label(s) and cover the label(s) with clear packing tape to secure the label onto the container.
22. After the indicator parameters have stabilized, collect groundwater samples by diverting flow out of the unfiltered discharge tubing into the appropriate labeled sample container.
    a. If a flow-through analytical cell is being used to measure field parameters, the flow-through cell will be disconnected after stabilization of the field indicator parameters and prior to groundwater sample collection.
    b. Under no circumstances will analytical samples be collected from the discharge of the flow- through cell.
    c. If an in-line ‘T’ and valve are used, the valve needs to be removed as well.

d. Samples will be collected in the following order: VOCs, total organic carbon (TOC), semi- volatile organic compounds (SVOCs), metals and cyanide, and others (or other order as defined in the site-specific FIP/work plan).
e. When the container is full, tightly screw on the cap.

23. If sampling for total and filtered metals and/or polychlorinated biphenyls (PCBs), a filtered and unfiltered sample will be collected.
    a. Install an in-line, disposable 0.45-micron particle filter on the discharge tubing after the appropriate unfiltered groundwater sample has been collected.
    b. Continue to run the pump until an initial volume of "flush" water has been run through the filter in accordance with the manufacturer's directions (generally 100 to 300 mL).
    c. Collect the filtered groundwater sample by diverting flow out of the filter into the appropriately labeled sample container.
    d. When the container is full, tightly screw on the cap.
24. Secure with packing material and store the samples on ice in an insulated transport container provided by the laboratory and include a temperature blank in each container to be shipped.
25. Record on the Low-Flow Sampling Field Form (and bound field logbook) the time at which sampling procedures were completed, any pertinent observations of the sample (e.g., physical appearance and the presence or lack of odors or sheens), and the values of the stabilized field indicator parameters as measured during the final reading during purging **(see Attachment A)**.
26. Turn off the pump and air compressor or close the gas cylinder valve if using a bladder pump setup.
27. Slowly remove the pump, tubing, lines, and safety cable from the well.
    a. If using dedicated tubing, do not allow the tubing or lines to touch the ground or any other surfaces which could contaminate them.
    b. If using dedicated tubing, it will be folded - without pinching it - to a length that will allow the well to be capped and also facilitate retrieval of the tubing during later sampling events.
    c. Use a length of rope or string to tie the tubing to the well cap.
    d. Alternatively, if tubing and safety line are to be saved and reused for sampling the well at a later date, coil the tubing neatly and placed in a clean plastic bag that is clearly labeled with the well ID ensuring the bag is tightly sealed before placing it in storage.
28. Secure the well and properly dispose of personal protective equipment (PPE) and disposable equipment.
29. Complete the procedures for packaging, shipping, and handling with the associated Chain-of- Custody.
30. Complete decontamination for flow-through analytical cell and submersible or bladder pump, as appropriate *(TGI – Groundwater and Soil Sampling Equipment Decontamination).*
31. At the end of each day of the sampling event, perform calibration check of field instruments and record procedure and results in field log.

9 Waste Management

Materials generated during groundwater sampling activities, including disposable equipment and excess purge water, will be stored on site in appropriately labeled containers and disposed of properly. Waste will be managed in accordance with the *TGI – Investigation-Derived Waste Handling and Storage*, the procedures identified in the

FIP or QAPP as well as state-, federal- or client-specific requirements. Be certain that waste containers are properly labeled and documented in the field logbook.

10 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

Management of the original documents from the field will be completed in accordance with the site- specific QAPP.

In general, forms (e.g., Low-Flow Sampling Field Forms), logs/notes (including daily field and calibration logs), digital records, and Chain-of-Custody records will be maintained by the field team lead.

Field logs and Chain-of-Custody records will be transmitted to the Arcadis Project Manager and/or Task Manager, as appropriate, at the end of each day unless otherwise directed. Electronic data files will be sent to the project team and uploaded to the electronic project folder daily.

Records generated as a result of this TGI will be controlled and maintained in the project record files in accordance with project requirements.

11 Quality Assurance

Quality assurance procedures shall be conducted in accordance with the Arcadis Quality Management System or the site-specific QAPP.

Unless described otherwise in the project-specific FIP/work plan, QAPP, or Sampling and Analysis Plan, quality assurance/quality control samples will be collected as follows:

- One duplicate for every 10 samples
- One laboratory matrix/matrix spike sample for every 20 samples
- In addition to the quality control samples to be collected in accordance with this TGI, the following quality control procedures will be observed in the field:
- Collect samples from monitoring wells, in order of increasing concentration, to the extent known based on review of historical site information if available
- Equipment blanks will include the pump and tubing (if using disposable tubing) or the pump only (if using tubing dedicated to each well)
- Collect equipment blanks after wells with higher concentrations (if known) have been sampled

- Operate all monitoring instrumentation in accordance with manufacturer's instructions and calibration procedures—calibrate instruments at the beginning of each day, verify the calibration at the end of each day, and record all calibration activities in the field notebook
- Clean all groundwater sampling equipment prior to use in the first well and after each subsequent well following the procedure for equipment decontamination

12 References

USEPA. 1986. *RCRA Groundwater Monitoring Technical Enforcement Guidance Document* (September 1986).

USEPA. 1991. *Handbook Groundwater, Volume II Methodology*, Office of Research and Development, Washington, DC. USEPN62S, /6-90/016b (July 1991).

USEPA Region I. 2017. *Low Stress (Low Flow) Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells (*EQASOP-GW4; September 19, 2017).

U.S. Geological Survey (USGS). 1977. *National Handbook of Recommended Methods for Water-Data Acquisition: USGS Office of Water Data Coordination*. Reston, Virginia.

13 Attachments

Attachment A – Low Flow Sampling Field Form

Attachment A

Low-Flow Sampling Field Form

GROUNDWATER SAMPLING FORM

ARCADIS

Project No. ______________________ Well ID ______________ Date __________

Project Name/Location ______________________________________ Weather __________

Measuring Pt. Description __________ Screen Setting (ft-bmp) __________ Casing Diameter (in.) ______ Well Material ___ PVC ___ SS

Static Water Level (ft-bmp) __________ Total Depth (ft-bmp) __________ Water Column (ft) ______ Gallons in Well ______

MP Elevation __________ Pump Intake (ft-bmp) __________ Purge Method: __________ Sample Method __________

Centrifugal __________

Submersible __________

Other __________

Pump On/Off __________

Sample Time: ________ Volume Purged __________

Purge Start ________ Gallons Purged __________ Sample ID ______ Sampled by __________

Purge End ________ Replicate/Code No. ______

Time	Minutes Elapsed	Rate (gpm)/(mL/min) 200mL/min +	Depth to Water (ft) -0.3	Gallons Purged	pH ± 0.1	Cond. (μMhos)/(mS/cm) ± 3%	Turbidity (NTU) ± 10%	DO (mg/L) ± 10%	Temp. (°C)/(°F) ± 3%	Redox (mV) ± 10mV	Appearance: Color	Appearance: Odor
Stabilization Calculations (±)												
Stabilization Criteria					**± 0.1 s.u.**	**±3%**	**± 10% or within 1 NTU** (1)	**± 10%**	**±3%**	**±10 mV**		

(1) **Turbidity** < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

Constituents Sampled	**Container**	**Number**	**Preservative**

Comments ____

Well Casing Volumes

Gallons/Foot *1" = 0.04* *1.25" = 0.06* *1.5" = 0.09* *2" = 0.16* *2.5" = 0.26* *3" = 0.37* *3.5" = 0.50* *4" = 0.65* *6" = 1.47*

Well Information

Well Location:		Well Locked at Arrival:	Yes / No
Condition of Well:		Well Locked at Departure:	Yes / No
Well Completion:	Flush Mount / Stick Up	Key Number To Well:	

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TGI - Equipment and Reagent Blank Sample Collection for PFAS Analysis

Rev: 2.1

Rev Date: March 20, 2025

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
--	0	October 2, 2018	All	TGI – Equipment and Reagent Blank Sample Collect for PFAS Analysis	Erika Houtz
Outdated template	1	December 10, 2021	All	Updated to current TGI format. Also updated sections to match the most recent TGI for PFAS Field Sampling Guidance (Arcadis 2021)	Kevin Engle
Template Updates	2	February 21, 2022	All	Additional template updates	Kevin Engle, Johnsie Lang
Annual Review	2.1	March 20, 2025		Editorial changes only	Kevin Engle, Johnsie Lang

Approval Signatures

Prepared by:		3/20/2025
	Kevin Engle (Preparer)	Date
Reviewed by:		3/20/2025
	Johnsie Lang, PhD (Subject Matter Expert)	Date

1 Introduction

This document is intended to provide guidance to field staff collected equipment blanks for Per- and Polyfluoroalkyl Substances (PFAS). The content in this document describes the intended use, scope and application, personnel qualifications, equipment, cautions, health and safety considerations, procedures, waste management, data recording and management, and quality assurance of PFAS sampling.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

Equipment and reagent blanks will be collected in the field during sampling activities and submitted for laboratory analysis. These samples are primarily intended to verify that sampling and decontamination practices are effectively preventing cross-contamination caused by reusable sample equipment or (PFAS)-containing materials.

The intent of this Technical Guidance Instruction (TGI) is to provide instructions for collection of equipment and reagent blanks. More detailed instructions related to general PFAS sampling considerations is provided in the TGI Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance.

4 Personnel Qualifications

Equipment and reagent samples will be collected by persons who have been trained in proper sampling procedures under the guidance of an experienced field geologist, engineer, or technician. Blank sampling should be completed with a two-person sampling team.

5 Equipment List

The following equipment and materials must be available for equipment and reagent blank sampling:

- Site plan which specifies frequency/quantity of blank sampling;
- Relevant work plan (e.g., PQAPP);
- Site Safety and Health Plan (SSHP);
- Appropriate health and safety equipment, as specified in the SSHP;
- Laboratory-provided “PFAS-free” water;
- Nitrile gloves;
- Dedicated plastic sheeting (preferably low-density polyethylene) or other clean surface to prevent sample contact with the ground;
- Pail or bucket with closable lid for excess rinse water;
- Garbage bags;
- Appropriate sample containers and labels:
    - Labeled high density polypropylene (HDPE) sample bottles: see the Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2021) for PFAS-specific considerations;
    - Ziploc®-style bags to hold ice and samples;
    - Packing and shipping materials;
    - Chain-of-Custody (COC) Forms; see the Sample Chain of Custody Standard Operating Procedure (SOP) for reference (Arcadis 2017a); and
    - Appropriate transport containers (coolers) with ice and appropriate labeling; no blue ice is to be used.
- Decontamination:
    - Equipment cleaning materials: see the Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2021) or the Groundwater and Soil Sampling Equipment Decontamination TGI (Arcadis 2017b) as applicable;
    - An organic solvent such as isopropanol, methanol, or acetone should be used to decontaminate reusable equipment if it can be brought to the site safely. While strongly recommended, the use of solvents may be excluded for project-specific health and safety concerns. Refer to Section 7.1.1 for more details; and
    - Drum labels as required for investigation-derived waste handling: see the Investigation-Derived Waste Handling and Storage TGI for details.

- Field Notes:
    - Pens, pencils, and/or fine point Sharpies® for writing;
    - Appropriate field forms; and
    - Clipboards, field binders, field notebook, and field note pages that are not waterproof.

6 Cautions

In general, sampling techniques used for PFAS sample collection are consistent with conventional sampling techniques used in the environmental industry, but special consideration is made regarding PFAS-containing materials and cross-contamination potential. The most important consideration during PFAS-related sampling is to prevent contact between sample media and suspect PFAS sources. During collection of equipment and reagent blanks, the sampled media (i.e., PFAS-free water) should not contact anything but the sample container. New nitrile gloves should be donned after handling of any non-dedicated sampling equipment; contact with contaminated surfaces; and whenever judged necessary by field personnel. When in doubt change your gloves. More detailed instructions related to general PFAS sampling considerations is provided in the TGI - Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance.

7 Health and Safety Considerations

Field activities associated with equipment and reagent blank sampling will be performed in accordance with the SSHP, a copy of which will be present on site during such activities. Additional health and safety considerations can be found in TGI for PFAS Field Sampling Guidance.

8 Procedure

The specific procedure for equipment and reagent blank sampling was developed after careful review and consideration of project data quality objectives. Procedures for equipment blank sampling and reagent blank sampling are further described in this section. Note: the laboratory has to analyze the entire sample bottle for aqueous solutions of PFASs. When collecting each blank, fill two sample bottles and instruct the lab to hold one of them in reserve. If an unacceptable detection occurs in a blank, the second bottle of sample may be analyzed.

For additional sampling considerations, reference the TGI for PFAS Field Sampling Guidance.

8.1 Blank Sampling

8.1.1 Decontamination

Prior to collecting blank samples, the applicable piece of equipment should be properly decontaminated following these steps:

- Hand Tools and Sampling Devices (including hand augers and bladder pumps)
    1. Don new pair of nitrile gloves prior to decontamination.
    2. Remove O-rings and bladder (applies only to bladder pump).

3. Scrub using a plastic brush and a non-phosphate soap free of volatile organic compounds (VOCs) (e.g., Liquinox, Alconox);
4. Double-rinse in deionized or distilled water;
5. Rinse once with the site-approved organic rinsing solvent (e.g., isopropanol, methanol, acetone);
6. Rinse once with PFAS-free water;
7. Collect all rinsate in a sealed pail for disposal;
8. Allowed time to air dry prior to re-use; and
9. Insert new o-rings and bladder (applies only to bladder pump);

While strongly recommended, the use of solvents may be excluded for project-specific health and safety concerns. If solvents are prohibited, then additional procedures should be evaluated by the project team. Contingencies could include the use of dedicated sampling equipment at each sampling location or amending laboratory procedures to mitigate the increased risk of cross-contamination.

The following decontamination procedure could be utilized when organic solvent use is not possible:

1. Don new pair of nitrile gloves prior to decontamination.
2. Remove o-rings and bladder (applies only to bladder pump);
3. Scrub using a plastic brush and a non-phosphate soap free of VOCs (e.g., Liquinox, Alconox);
4. Single-rinse in deionized or distilled water;
5. Scrub using a plastic brush and a non-phosphate soap free of VOCs (e.g., Liquinox, Alconox);
6. Rinse twice with deionized water and once with PFAS-free water;
7. Collect all rinsate in a sealed pail for disposal;
8. Allowed time to air dry prior to re-use.
9. Insert new o-rings and bladder (applies only to bladder pump)

- Drilling Rods
    - Drive casings and other drilling equipment will be steam cleaned or replaced with new equipment between boreholes.
    - The drilling equipment will be cleaned in an area designated by the supervising engineer or geologist that is located outside of the work zone.

After verifying the piece of equipment is properly decontaminated, and after determining an equipment blank is warranted per the sampling quality assurance and quality control (QA and QC) plan, follow the specific procedures for the relevant type of equipment found in the following sections.

8.1.2 Drilling Equipment (Hand Auger or Cutting Shoe/Drill Rod)

Two field personnel should participate in the collection of the equipment blank. One person (“Field Personnel #1”) should hold the sampling bottle and collect the sample, and the second person (“Field Personnel #2”) should pour the rinse water.

The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFASs, after the sampling equipment has been appropriately decontaminated.

1. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep bottle lid on until immediately prior to sample collection.
2. Lay down dedicated plastic sheeting or other clean surface to prevent sample contact with the ground.
3. Place the sealable bucket or pail on top of plastic sheeting.
4. Don a new pair of nitrile gloves prior to blank collection (Field Personnel #1 and #2). Do not use gloved hands to handle other objects (e.g., papers, pens, clothes, equipment) before collecting samples.
5. Open the sample container and position the piece of clean, decontaminated sample equipment (i.e., hand auger or drilling rod/cutting shoe) above the container (Field Personnel #1). Keep the sample cap in the hand of the sampler (Field Personnel #1) until it is replaced on the bottle.
   a. The bucket of the hand auger can be removed from the rods/handle and held manually.
   b. The drillers should assist the field staff with removing the cutting shoe from the drill string and positioning it for sampling.
6. Slowly pour laboratory-provided “PFAS-free” water over any surface of the decontaminated sampling device that previously contacted sampled material (Field Personnel #2).
   a. Pour water through the inside of the hand auger bucket while manually rotating the bucket so that “PFAS-free” water contacts all sides of the sampling device. Collect runoff in the sample container (Field Personnel #1), making sure that any excess “PFAS-free” water is contained in the sealable bucket or pail.
   b. Pour water through the inside of cutting shoe while drilling contractor holds and manually rotates the shoe so that “PFAS-free” water contacts all sides of the shoe (Field Personnel #2). Collect runoff in the sample container, making sure that any excess “PFAS-free” water is contained in the sealable bucket or pail.
7. After collecting the necessary sample volume, place cap back on the sample bottle (Field Personnel #1). The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
8. Collect the second bottle with the same procedure (Steps 5 to 7), if collecting a backup.
9. Record any label information that was not pre-filled out, if necessary (e.g., sample time), and place filled sample bottles in sealed Ziploc® bags. Record the label information and time of sampling in the field notes.
10. Add sample to the laboratory COC. Double check that the sample labels and COC agree. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
11. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in separate cooler from any other types of samples.
12. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

8.1.3 Reusable Sediment Sampling Equipment (Stainless-Steel Hand Tools, Petite Ponar Grab Sampler)

Two field personnel should participate in the collection of the equipment blank. One person (“Field Personnel #1”) should hold the sampling bottle and collect the sample, and the second person (“Field Personnel #2”) should pour the rinse water.

The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFASs, after the sampling equipment has been appropriately decontaminated.

1. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep bottle lid on until immediately prior to sample collection.
2. Lay down dedicated plastic sheeting or other clean surface to prevent sample contact with the ground.
3. Place sealable bucket or pail on top of plastic sheeting.
4. Don new pair of nitrile gloves prior to blank collection (both field personnel). Do not use gloved hands to handle other objects (e.g., papers, pens, clothes, equipment) before collecting samples.
5. Open sample container and position the clean, decontaminated piece of sample equipment (i.e., hand tool, grab sampler) above the container (Field Personnel #1). Keep the sample cap in the hand of the sampler (Field Personnel #1) until it is replaced on the bottle.
6. Slowly pour the laboratory-provided "PFAS-free" water over any surface of the sampling device that contacted sampled material (Field Personnel #2).
    a. Pour water over front and back of all decontaminated hand tools such as spoons, spatulas, and trowels so that "PFAS-free" water touches all sides of the sampling device. Collect runoff in the sample container, making sure that any excess "PFAS-free" water is contained in the sealable bucket or pail (Field Personnel #1).
    b. Pour water through inside of the decontaminated Petite Ponar Grab Sampler while rotating the sampler (or the "PFAS-free" water container) so that "PFAS-free" water contacts all interior sides of the sampler (Field Personnel #2). Collect runoff in the sample container, making sure that any excess "PFAS-free" water is contained in the sealable bucket or pail.
7. After collecting the necessary sample volume, place cap back on the sample bottle (Field Personnel #1). The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
8. Collect the second bottle with the same procedure (Steps 5 to 7), if collecting a backup.
9. Record any label information that was not pre-filled out, if necessary (e.g., sample time), and place filled sample bottles in sealed Ziploc® bags. Record the label information and time of sampling in the field notes.
10. Add the sample to the laboratory COC. Double check that the sample labels and COC agree. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
11. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in separate cooler from any other types of samples.
12. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

8.1.4 Disposable Sediment Sampling Equipment (Lexan TM Liner Sleeve)

Two field personnel should participate in the collection of the equipment blank. One person ("Field Personnel #1") should hold the sampling bottle and collect the sample, and the second person ("Field Personnel #2") should pour the rinse water.

The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFASs, after the sampling equipment has been appropriately decontaminated.

1. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep the bottle lid on until immediately prior to sample collection.
2. Lay down dedicated plastic sheeting or other clean surface to prevent sample contact with the ground.
3. Place sealable bucket or pail on top of plastic sheeting.
4. Don new pair of nitrile gloves prior to blank collection (both field personnel). Do not use gloved hands to handle other objects (e.g., papers, pens, clothes, equipment) before collecting samples.
5. Open sample container and position a clean, new, and unused section of Lexan™ liner above the container (Field Personnel #1). Keep the sample cap in the hand of the sampler (Field Personnel #1) until it is replaced on the bottle.
6. Slowly pour laboratory-provided “PFAS-free” water over any surface of the sampling device that contacted sampled material (Field Personnel #2).
    a. Pour water through inside of Lexan™ liner while rotating the liner so that “PFAS-free” water contacts all interior sides of the liner. Collect runoff in the sample container, making sure that any excess “PFAS-free” water is contained in the sealable bucket or pail.
7. After collecting the necessary sample volume, place cap back on the sample bottle (Field Personnel #1). The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
8. Collect the second bottle with the same procedure (Steps 5 to 7), if collecting a backup.
9. Record any label information that was not pre-filled out, if necessary (e.g., sample time), and place filled sample bottles in sealed Ziploc® bags. Record the label information and time of sampling in the field notes.
10. Add sample to the laboratory COC. Double check that the sample labels and COC agree. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
11. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in separate cooler from any other types of samples.
12. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

8.1.5 Reusable Water Sampling Equipment (Peristaltic Pump, Bladder Pump, Stainless-Steel Bailer)

8.1.5.1 Peristaltic Pump

Two field personnel should participate in the collection of the equipment blank. One person (“Field Personnel #1”) should hold the sampling bottle and collect the sample, and the second person (“Field Personnel #2”) should set up the pump and pour/ transfer the blank water.

The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFASs, after the sampling equipment has been appropriately decontaminated.

1. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep bottle lid on until immediately prior to sample collection.

2. Lay down dedicated plastic sheeting other clean surface to prevent sample contact with the ground.
3. Don new pair of nitrile gloved prior to blank collection (both field personnel). Do not use gloved hands to handle other objects (e.g., papers, pens, clothes, equipment) before collecting samples.
4. Pour laboratory-supplied “PFAS-free” water into a clean HDPE sample bottle (Field Personnel #2).
5. Insert new HDPE tubing into the HDPE bottle containing “PFAS-free” water and connect tubing to peristaltic pump (with new silicone tubing) (Field Personnel #2).
6. Open sample container, keeping the sample cap in the hand of the sampler until it is replaced on the bottle (Field Personnel #1).
7. Turn the peristaltic pump on and slowly pump the “PFAS-free” water into the labeled sample container (Field Personnel #2).
8. After collecting the necessary sample volume, place cap back on the sample bottle (Field Personnel #1). The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
9. Collect the second bottle with the same procedure (Steps 6 to 8), if collecting a backup.
10. Record any label information that was not pre-filled out, if necessary (e.g., sample time), and place filled sample bottles in sealed Ziploc® bags. Record the label information and time of sampling in the field notes.
11. Add the sample to the laboratory COC. Double check that the sample labels and COC agree. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
12. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in separate cooler from any other types of samples.
13. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

8.1.5.2 Bladder Pump

1. Two field personnel should participate in the collection of the equipment blank. One person (“Field Personnel #1”) should hold the sampling bottle and collect the sample, and the second person (“Field Personnel #2”) should set up the pump and pour/ transfer the blank water.
2. The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFASs, after the sampling equipment has been appropriately decontaminated.
3. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep the bottle lid on until immediately prior to sample collection.
4. Lay down dedicated plastic sheeting or other clean surface to prevent sample contact with the ground.
5. Don new pair of nitrile gloved prior to blank collection (both field personnel). Do not use gloved hands to handle papers, pens, clothes, equipment, etc., before collecting samples.
6. Pour laboratory-supplied “PFAS-free” water into an approved container (to avoid PFAS cross-contamination) large enough to submerge the bladder pump.
7. After properly decontaminating the bladder pump and replacing the bladder, attach a new section of HDPE tubing to the bladder pump, long enough to hold and direct flow into the labeled sample container. Submerge the bladder pump into the approved container of “PFAS-free” water (Field Personnel #2).

8. Open sample container, keeping the sample cap in the hand of the sampler until it is replaced on the bottle (Field Personnel #1).
9. Turn the bladder pump on and slowly pump the “PFAS-free” water into the labeled sample container (Field Personnel #2).
10. After collecting the necessary sample volume, place cap back on the sample bottle. The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
11. Collect the second bottle with the same procedure (Steps 6 to 8), if collecting a backup.
12. Record any label information that was not pre-filled out, if necessary (e.g., sample time), and place filled sample bottles in sealed Ziploc® bags. Record the label information and time of sampling in the field notes.
13. Add sample to laboratory COC. Double check that the sample labels and COC agree. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
14. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in separate cooler from any other types of samples.
15. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

8.1.5.3 Stainless-Steel Bailer

Two field personnel should participate in the collection of the equipment blank. One person (“Field Personnel #1”) should hold the sampling bottle and collect the sample, and the second person (“Field Personnel #2”) should pour the rinse water.

The best timing to collect equipment blanks is immediately after the collection of a sample likely to contain high concentrations of PFASs, after the sampling equipment has been appropriately decontaminated.

1. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep bottle lid on until immediately prior to sample collection.
2. Lay down dedicated plastic sheeting or other clean surface to prevent sample contact with the ground.
3. Place sealable bucket or pail on top of plastic sheeting.
4. Don new pair of nitrile gloves prior to blank collection (both field personnel). Do not use gloved hands to handle other objects (e.g., papers, pens, clothes, equipment) before collecting samples.
5. Open sample container (Field Personnel #1) and position the bailer above the container (Field Personnel #2). Keep the sample cap in the hand of the sampler (Field Personnel #1) until it is replaced on the bottle.
6. Fill the stainless-steel bailer with enough laboratory-provided “PFAS-free” water to collect the necessary sample volume (Field Personnel #2).
7. Slowly pour laboratory-provided “PFAS-free” water from the stainless-steel bailer into the sample container (Field Personnel #2).
8. After collecting the necessary sample volume, place cap back on the sample bottle. The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
9. Collect the second bottle with the same procedure (Steps 5 to 8), if collecting a backup.

10. Place filled sample bottles in sealed Ziploc® bags, record any label information that was not pre-filled out, if necessary (e.g., sample time). Record the label information and time of sampling in the field notes and sampling forms.
11. Fill out the laboratory COC and check against the labels on the Equipment Blank sample bottle(s) progressively after each Equipment Blank is collected. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
12. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in a separate cooler from any other types of samples.
13. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

8.1.6 Field Reagent Blank Sampling

Two field personnel should participate in the collection of the reagent blank. One person (“Field Personnel #1”) should hold the sampling bottle and collect the sample, and the second person (“Field Personnel #2”) should pour the blank water.

This sample should be collected after field staff return from an offsite break (e.g., lunch) to capture any potential cross-contamination from field personnel.

1. Label the laboratory-provided HDPE bottles with applicable information (e.g., sample ID, date, time, analysis required). Keep the bottle lid on until immediately prior to sample collection.
2. Don new pair of nitrile gloves prior to blank collection (both field personnel). Do not use gloved hands to handle other objects (e.g., papers, pens, clothes, equipment) before collecting samples.
3. Open sample container, keeping the sample cap in the hand of the sampler (Field Personnel #1) until it is replaced on the bottle (Field Personnel #1).
4. Slowly pour laboratory-provided “PFAS-free” water from the laboratory-provided container into the sample container (“Field Personnel #2”).
5. After collecting the necessary sample volume, place cap back on the sample bottle. The bottle should be filled approximately full, but some headspace in the bottle is acceptable.
6. Collect the second bottle with the same procedure (Steps 3 to 5) if collecting a backup.
7. Record any label information that was not pre-filled out, if necessary (e.g., sample time), and place filled sample bottles in sealed Ziploc® bags. Record the label information and time of sampling in the field notes.
8. Add sample to the laboratory COC. Double check that the sample labels and COC agree. Note on the COC that one bottle should be held in reserve, if a backup bottle is collected.
9. Place sealed Ziploc® bag into the sample cooler. Store PFAS samples in separate cooler from any other types of samples.
10. Place dedicated plastic sheeting and nitrile gloves in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

9 Waste Management

Excess water generated during equipment and reagent blank collection procedures will be collected and contained on site in appropriate containers, (see TGI for Investigation-Derived Waste Handling and Storage, for details). All investigation-derived waste (IDW) generated will be placed in Department of Transportation approved containers, sealed, and labeled. Containerized IDW will be stored on site until it is profiled and subsequently transported to an approved facility for disposal or recycling. Waste manifests for all IDW suspected to have come into contact with PFAS should clearly note the presence of PFAS. Additional IDW sampling and management details will be provided in the site-specific Work Plan (Quality Assurance Project Plan, QAPP addendum) and will be consistent with applicable client policies and requirements. Disposable personal protective equipment (e.g., gloves, disposable clothing, disposable equipment) will be placed in plastic bags. These bags will be transferred into appropriately labeled containers for appropriate disposal.

10 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

If digital data collection isn't possible, waterproof field books should be avoided for field notes. Instead, field notes on loose paper on Masonite, plastic, or aluminum clip boards is preferred. Please note that newer Rite in the Rain® notebooks are approved for PFAS sampling. Other requirements for field notes include:

- Pens, pencils, and fine point Sharpies® may be used.
- Keep field notes and writing implements away from samples and sampling materials.
- Do not write on sampling bottle labels unless the sample bottle covers are tightly closed.
- Complete sampling logs in their entirety.
- Make sure COC forms are properly completed. Verify that the analysis method requested is US EPA Method 537.1 for potable water and includes the appropriate analytes desired for analysis.

11 Quality Assurance

Refer to quality control requirements for the project to ensure that appropriate QA and QC samples are collected. When collecting QA and QC samples, the same guidelines apply as when collecting regular samples – specifically:

- **Duplicate samples of each equipment blank and reagent blank should be collected and submitted to the laboratory with instructions to hold for analysis. The purpose of this sample is to provide analytical back-up in case there are any issues with the original blank sample.**

- Samples should be collected in laboratory-supplied HDPE bottles.
- Bottle caps must remain in the hand of the sampler until replaced on the bottle;
- Labels must be completed after the caps have been placed back on each bottle.

Samples must be stored in appropriate transport containers (coolers) with ice (Ziploc®-type bags for use as ice containers) with appropriate labeling. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**

12 References

Arcadis TGI – TGI for Per- and Polyfluoroalkyl Substances (PFAS) Field Sampling Guide.pdf

Arcadis SOP – TGI for Sample Chain of Custody.pdf

Arcadis TGI – TGI for Groundwater and Soil Sampling Equipment Decontamination.pdf

Arcadis TGI – TGI for Investigation-Derived Waste Handling and Storage.pdf

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TGI – Vertical Aquifer Profile (VAP) Sampling

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Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
1	0	June 22, 2018	All	Original SOP	Joe Quinnan
2	1	May 11, 2020	Multiple	Added content to Personnel Qualifications, references to Geoprobe SP-16 and SP-22, Attachment 3, and updated references /formatting	Marc Killingstad
3	2	June 15, 2022	Multiple	Combined with PFAS-specific VAP TGI and dye/tracer procedures.	Patrick Curry
4	3	June 18, 2024	All	Annual review by SME completed.	Patrick Curry
5	3.1	March 25, 2025	All	Annual review completed, editorial changes only	Patrick Curry

Approval Signatures

Prepared by:

6/18/2024

Patrick Curry (Preparer) Date

Reviewed by:

3/25/2025

Marc Killingstad (Subject Matter Expert) Date

1 Introduction

This Arcadis Technical Guidance Instruction (TGI) describes proper vertical aquifer profile (VAP) sampling procedures using a variety of methods and approaches. This document has been developed to emphasize drilling and sampling procedures used to collect groundwater samples from boreholes installed via direct push technology (DPT), hollow stem auger (HSA), and rotary-sonic (sonic) methods and includes the use of visible tracer in drilling fluid to obtain representative samples during vertical profiling.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

Vertical aquifer profile (VAP) borings are typically advanced via DPT, HSA, or sonic drilling techniques to collect single or multiple depth-discrete groundwater samples using low-flow or grab sampling methodologies. This can be combined with retrieval of continuous soil cores and lithologic logging, as well as collection of single or multiple depth-discrete dry and saturated soil samples.

When possible, co-locate or bias VAP groundwater sampling intervals towards potential discrete transport zones (and target slow advection zones when feasible) as indicated by soil logging observations or permeability measurements (e.g., point slug tests, Geoprobe® hydraulic profiling tool [HPT] [preferred], Waterloo APS™ [alternate]). Permeability measurements coupled with contaminant concentration allows estimation of relative flux and mass discharge to evaluate potential risk to downgradient receptors. In the absence of permeability measurements, field soil lithological logging observations may be used to interpret hydrostratigraphy and select sampling intervals.

The intent of this TGI is to provide VAP instructions including specific considerations for per- and polyfluoroalkyl substances (PFAS) due to their unique chemical and physical properties, low detection limits, and regulatory standards. It also covers field procedures for using nontoxic fluorescent tracer (e.g., fluorescein dye) in drilling fluid during drilling to assist in determining when sufficient purging has been performed prior to collecting screening-level groundwater samples during the drilling process. Screening level groundwater samples may be obtained by evacuating water from the drill casing or from intervals of geologic formations isolated by inflatable packers. This procedure improves the quality of screening-level groundwater samples by providing a technical basis to determine when purging has sufficiently removed drill water prior to collecting screening-level groundwater samples.

Multiple VAP samples can be collected through temporary wells, drilling rod tooling (e.g., Geoprobe® Screen Point 16 [SP-16]/Screen Point 22 [SP-22] Groundwater Samplers or SP-60 Sonic Groundwater Sampler or Cascade's Sonic Push-Ahead or Packer Isolation Groundwater Profilers) or via combined hydraulic profiling and sampling tools (e.g., Geoprobe® HPT-Groundwater Sampling System [HPT-GWS] or Waterloo APS™). They can be analyzed quickly via on-site mobile lab or expedited off-site fixed lab analysis to provide adaptive high-resolution quantitative groundwater concentration data. The vertical frequency of groundwater sampling within a formation will be determined relative to the scale of variability demonstrated in site hydrostratigraphy and outlined in the FIP/Work Plan. Thin aquifers with transport zones only tens of feet thick (or less) can be sampled at intervals as close as 3 to 5 feet. In aquifers with transport zones substantially thicker (e.g., more than 50 feet), sample spacing of 5 to 20 feet may be adequate. It is important to note that field data be evaluated to verify that sampling intervals provide sufficient resolution to meet data quality objectives (DQOs) (See **Section 7**).

4 Personnel Qualifications

In general, VAP activities will be performed by persons who have been trained in proper drilling and sampling procedures under the guidance of an experienced field geologist, engineer, or technician. Arcadis personnel overseeing, directing, or supervising VAP activities shall have previous related experience (minimum of 2 years) in drilling and groundwater sampling. Drilling subcontractors will need current applicable drilling licenses.

Arcadis field personnel will have completed or are in the process of completing site-specific training as well as having current health and safety training as required by Arcadis, client, or regulations, such as 40-hour HAZWOPER training and/or OSHA HAZWOPER site supervisor training. Arcadis personnel will also have current training as identified in the site-specific Health and Safety Plan (HASP) which may include first aid, cardiopulmonary resuscitation (CPR), Blood Borne Pathogens (BBP) as needed. The HASP will also identify any access control requirements.

Prior to mobilization, the field team will review and be thoroughly familiar with relevant site-specific documents including but not limited to the task-specific work plan or field implementation plan (FIP)/field sampling plan, Quality Assurance Project Plan (QAPP), HASP, historical information, and other relevant site documents.

Arcadis field sampling personnel will be knowledgeable in the relevant processes, procedures, and TGIs and possess the demonstrated required skills and experience necessary to successfully complete the desired field work. Additionally, the field team will review and be thoroughly familiar with documentation provided by equipment manufacturers and become familiar with the operation of (i.e., hands-on experience) all equipment that will be used in the field prior to mobilization.

5 Equipment List

The following equipment and materials must be available for VAP sampling

- Site plan with proposed sampling locations
- Relevant work plan (or equivalent)
- Health and Safety Plan (HASP)
- Field Tablet with appropriate Fulcrum app for logging groundwater sampling.
- NOTE: *As of June 2022, several digital logging applications are available through the FieldNow™ program and the Fulcrum app. A future revision of this TGI, likely in early 2023, will emphasize digital logging methods and groundwater sampling. FieldNow™ is discussed further in Section 10.*
- Appropriate health and safety equipment, as specified in the site HASP
    - Drilling Equipment
    - Drill rig (to be provided by drilling subcontractor). Type (e.g., roto-sonic, direct push) to be determined based on site-specific details
    - Traffic cones, delineators, caution tape, and/or fencing as appropriate for securing the work area, if not provided by the drillers

    NOTE: *Prior to mobilizing to the site, Arcadis personnel will contact the drilling subcontractor or in-house driller (as appropriate) to confirm that appropriate sampling equipment will be provided in quantities capable of achieving estimated target depths. Typical equipment/materials provided by the driller could includ*e

        - Acetate or plastic liners
        - Appropriate length of drilling rods and tooling
        - Drilling and sampling equipment decontamination materials,
        - Decontamination pad materials, if required. See **Section 6.3** below for more information

- Sampling Equipment
    - Appropriate groundwater sampling equipment (e.g., disposable bailers for volumetric sampling, peristaltic pump for shallow groundwater sampling, submersible bladder pump for deeper sampling). Refer to *the TGI – Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* (Arcadis 2020a) for necessary equipment
    - Direct push groundwater samplers (e.g., Geoprobe® SP-22) or roto-sonic sampling devices (e.g., Cascade Push Ahead/Packer Isolation Groundwater Profiler or Geoprobe® SP-60 Sonic Groundwater Sampler) (to be provided by drilling subcontractor)
    - Appropriate soil sampling equipment (e.g., stainless steel spatulas, knife, metal trowel)

- Dedicated plastic sheeting (preferably high-density polyethylene [HDPE]) or other clean surface to prevent sample contact with the ground
- Multi-parameter water quality probe (e.g., conductivity, temperature, pH, dissolved oxygen, oxidation reduction potential, and turbidity meter)
- Water level meter
- Appropriate sample containers and labels
  - Labeled sample bottles: see the *TGI – Poly- and Perfluorinated Alkyl Substances (PFAS)Field Sampling Guidance* (Arcadis 2017a) for PFAS-specific considerations
  - Ziplock-style bags to hold ice and samples
  - Appropriate blanks (field reagent blanks supplied by the laboratory)
  - Packing and shipping materials
  - Chain-of-Custody (COC) Forms; see the *Sample Chain of Custody* for reference (Arcadis2017b)
  - Appropriate transport bottles (coolers) with ice and appropriate labeling, no blue ice

- Decontamination Equipment
  - Equipment cleaning materials: see the *TGI – Poly- and Perfluorinated Alkyl Substances (PFAS)Field Sampling Guidance* (Arcadis 2017a) or the *TGI – Groundwater and Soil Sampling Equipment Decontamination* (Arcadis 2020b) as applicable
  - Drum labels as required for investigation derived waste handling: see the *TGI – Investigation-Derived Waste Handling and Storage* for details (Arcadis 2017c)
- Documentation/Field Notes
  - Electronic data collection device (smart phone or tablet) as applicable
  - Pens, pencils, and/or Sharpie® brand pens for writing
  - Digital camera
  - Any other appropriate field forms
- Tracer Equipment (as needed)
  - Sodium fluorescein (also known as fluorescein or uranine dye) tracer (to be added to drilling water to produce a vibrant yellow-green color); 38 grams of dye will be added to each 500 gallons of drilling water (potable water) to achieve target applied tracer concentration of 20 milligrams per liter (mg/L)
  - Bottles for retaining dyed drilling water samples and preparing visual dye standards (clear, colorless, 40 mL unpreserved VOA bottles or equivalent)
  - Graduated cylinders (50 mL and 1 L)
  - Scale for measuring mass of dye to the nearest 1 gram
  - Bottles for groundwater samples to be analyzed for tracer dye (if necessary) and chemicals of concern (COCs)

- Poly storage tank (typically 550-to-1,000-gallon capacity)
- Potable water source
- Generator
- Utility pump for mixing dye
- Pump for groundwater purging and sampling
- Flashlight or other portable lighting device
- Blue ice (for tracer dye samples)

6 Cautions

Field activities associated with borehole advancement and VAP groundwater sampling will be performed in accordance with the HASP, a copy of which will be present on site during such activities. Field staff (including subcontractors) will be aware of and understand the associated physical and health hazards.

6.1 Utility Clearance

The appropriate drilling authorities will be contacted and a site visit for public utility line clearance at the proposed boring locations will be conducted at least 72 hours prior to work commencing. As applicable, utility maps will be reviewed during field reconnaissance of the proposed investigation locations to determine if any are co-located with public utility lines. Arcadis will also contract an independent geophysical survey company to verify that proposed boring locations are not co-located with existing underground utility/substructure features, as necessary. Arcadis will clear locations with soft dig methods to assess the presence of underground utilities as necessary.

See the *Utility Location and Clearance Arcadis Health and Safety Standard* (Arcadis 2020c) for reference.

6.2 PFAS-Specific General Sampling Considerations

This section provides a summary of methods and procedures applicable to the collection of environmental samples for field screening or laboratory analysis during PFAS site characterization activities. In general, sampling techniques used for PFAS site characterization are consistent with conventional sampling techniques used in the environmental industry, but special consideration is made regarding PFAS-containing materials and cross-contamination potential. For example, Teflon™ and other fluoropolymer containing materials are found in pumps, tubing, and sample storage containers and, therefore, will be avoided if possible (Department of Environment Regulation [DER], Western Australia 2016; New Hampshire Department of Environmental Services [NHDES] 2016). Certain field documentation materials such as waterproof paper or field books, adhesive paper products, and some writing utensils (grouped as non-Sharpie® markers) are also prohibited items during PFAS sampling (DER 2016; NHDES 2016).

Attachment 1 (Tables 1 and 2) provides recommendations for PFAS Site Investigation equipment. Table 1 provides a summary of materials that have been approved for site investigation; this list is expected to grow longer as industry experience increases. Table 2 provides a summary of field equipment and materials that have available testing information and/or industry knowledge regarding PFAS cross-contamination potential, and it is recommended that these materials be prohibited for sample collection. For materials that are suspected of containing and/or retaining PFAS, these recommendations are considered preliminary and subject to change.

Given the extremely low detection limits associated with PFAS analysis and the many potential sources of trace levels of PFAS, field personnel are typically advised to err on the side of caution by strictly following field wear guidelines and decontamination procedures as specified in the *TGI - Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance* (Arcadis 2022).The most important consideration during PFAS related VAP sampling is to prevent contact between sample media and suspect PFAS sources.

6.3 PFAS-Specific Groundwater Sampling

The potential presence of material containing PFAS in equipment that may come into contact with the target water sample must be evaluated as part of the sample planning process to maintain sample integrity. For example, low-flow sampling with a peristaltic pump will be conducted using silicone or HDPE tubing; Teflon™ tubing is prohibited (DER 2016). If a bladder pump is used to collect samples, the bladder and other internal parts (e.g., check balls, O-rings, compression fittings) will not contain Teflon™, and bladder and O-rings will be changed between samples (DER 2016).

Note that if high concentrations of PFAS related to Class B firefighting foams are expected in a groundwater sample, it has been recommended to collect and shake a small portion of the sample at the time of sample collection (USACE 2016; Arcadis 2017a). If foaming is noted within the sample, it indicates elevated concentrations of PFAS may be present and the sample will be proactively diluted at the laboratory prior to analysis, and the foaming will be noted on the sample COC form. It is recommended to collect sampling equipment blanks following foam observation to confirm the effectiveness of decontamination procedures.

6.4 Use of Tracer in Drilling Fluid

Field staff (including subcontractors) will be aware of tracer hazards and understand the associated health hazards. Please be sure to read the SDS (included as Attachment 2) for fluorescein dye. Note that some individuals can experience a mild allergic reaction to skin contact with fluorescein. Protective gloves will be worn during dye handling and mixing activities, and rinse bottles will be readily available for washing affected areas in case of accidental contact.

7 Health and Safety Considerations

To ensure the safety of the field personnel, field activities associated with VAP will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities. Review all site-specific and procedural hazards as they are provided in the HASP and review relevant Job SafetyAnalysis (JSA) documents in the field each day prior to beginning work.

Appropriate personal protective equipment (PPE) will be always worn in line with the task and the site-specific HASP. Verify staff has required health and safety training and personal protection equipment in accordance with the HASP and JSAs. At a minimum, all staff will have level D PPE with chemical resistant gloves.

8 Procedure

The specific procedure for advancing VAP borings will be developed after careful review and consideration of project DQOs and clearly detailed in the FIP/Work Plan. Typically, VAP borings are conducted in boreholes adjacent to soil borings previously completed to develop stratigraphic and relative permeability profiles of the aquifer to determine sampling depth intervals that target transport zones. Prior boreholes typically consist of soil borings with detailed soil descriptions or Geoprobe® HPT borings. The primary advantage of completing stratigraphic/permeability profiles in advance of VAP sampling is to gain an understanding of hydrofacies trends to ensure that the most appropriate intervals and sampling methods are used. For sonic or HSA drilling, VAP samples are typically collected from the same borehole as soil samples. In the absence of a co-located boring, sample depth intervals can be determined based upon lithologic logging of soil cores, either from a separate adjacent borehole or from the same borehole. HPT drilling will be completed consistent with the *TGI – Geoprobe Hydraulic Profiling Tool (HPT)* (Arcadis 2022a), and soil lithologic logging will be performed in accordance with *TGI – Soil Description* (Arcadis 2022b).

NOTE: *Waterloo APS™ can be utilized as an alternative to HPT to provide permeability profiles, but it is more time consuming than HPT; therefore, it is not considered the preferred tool for permeability profiling.*

8.1 Direct Push Vertical Aquifer Profile Sampling

Direct push tooling is ideal for shallow unconsolidated aquifers and requires minimal water for drilling, reducing the potential for sample dilution/cross-contamination. For sites with shallow groundwater in unconsolidated formations (e.g., at less than 100 feet bgs), the typical approach is to collect VAP groundwater samples nominally every 5 to 10 feet with a bias to the more permeable transport zones.

When a zone of interest is identified, either by using permeability measurements (preferred) or logging soil, a screen point sampling device such as Geoprobe® SP-16 or SP-22 (see **Attachment 3**) can be driven to the target interval and the screen opened to collect a groundwater sample. In poorly sorted aquifers with appreciable amounts of silt, VAP sampling from an adjacent borehole after completing initial permeability profiling (e.g., Geoprobe® HPT or point slug tests) is typically more efficient and cost effective. In the absence of permeability profiling tools (e.g., HPT), VAP sampling can be performed based on soil lithological observations alone, either from a separate borehole or in the same borehole. However, VAP sample collection can be more efficient when conducted from an adjacent borehole, particularly if a bottom-up sampling approach is used. See Section 8.1.1.

Combined permeability profiling and sampling tools such as the Geoprobe® HPT-GWS (or Waterloo APS™ as an alternate) can be used to collect groundwater samples based on permeability measurements from the same borehole at deeper depths where the process is more cost-effective; otherwise at shallower depths, separate permeability profiling prior to VAP sampling is preferred. This is most effective in well-sorted sand and gravel when small volumes are required for analysis, since these tools provide limited volumes for purging and sample collection. Use of these combined tools (HPT-GWS or Waterloo APS™) for PFAS sites is not recommended because low detection and regulatory thresholds for PFASs require more extensive purging to decontaminate the sampling equipment (i.e., insufficient data are available to confirm the volume of purging required to eliminate cross-contamination with PFAS).

It is recommended that DPT drilling for VAP sampling be completed using a dual-tube drilling approach. An outer casing is advanced with the screen point sampling device to limit the potential for cross-contamination between sampling intervals. Pre-calculated volume purging and monitoring for water quality parameter stabilization can be performed consistent with low-flow sampling to help determine when purge water is representative of the groundwater formation.

There are two general methods for completing VAP sampling: bottom-up and top-down. With bottom-up sampling, a greater purge volume is required to ensure a representative groundwater sample; however, the overall time savings is significant relative to top-down sampling, where more time is required per borehole to lower the tooling, retract it, and decontaminate it between subsequent sampling intervals. However, the top-down method minimizes any potential for cross-contamination and is the preferred approach for PFAS projects due to the low detection limits and regulatory levels associated with PFASs.

8.1.1 Bottom-Up VAP Sampling

Bottom-up VAP sampling involves advancing dual-tube direct push casing to the deepest target depth with either a solid drive tip (without collecting soil cores) or acetate liners for collection of continuous soil cores to provide a lithological log for the entire boring. This is followed by lowering the groundwater sampling screen through the outer casing to the bottom of the borehole and collecting multiple VAP groundwater samples at different depths as the casing and screen is retracted up the borehole.

Using this approach, the external casing is retracted to allow borehole collapse around the sampling screen while isolating it from the section above that is still covered by the external casing.

NOTE: *Bottom-up VAP sampling is not recommended when there is a potential for dense non-aqueous phase liquid (DNAPL), the highest concentrations are expected to be at the bottom of the formation, or the borehole goes through multiple confining units. Bottom-up is not recommended for PFAS sampling due to potential cross-contamination concerns associated with lack of decontamination between sample intervals.*

The advantages of this approach are: (1) when combined with soil core collection, groundwater sampling depth intervals can be pre-selected based on lithologic observations to target the transport zones, especially in the absence of any co-located permeability measurements, and (2) the entire process is much more time-efficient per borehole as the sampling equipment is not pulled, decontaminated, and then drilled to the next interval. However, additional purging (i.e., 3to 5 casing volumes) is required to assure a representative groundwater sample. Bottom-up sampling also does not allow for post-grouting of the borehole since when the groundwater sampling device is pulled up to the next VAP sampling interval, the sidewalls of the open borehole below collapse.

8.1.2 Top-Down VAP Sampling

Top-down VAP sampling involves advancing dual-tube direct push casing with either a solid drive tip (without collecting soil cores) or a plastic liner for soil core retrieval from target depth interval followed by lowering the screen point sampling screen to target depth and pulling up the outer casing to expose the screen. After purging and sample collection, the screen point device is pulled back up and decontaminated. A solid drive tip or plastic liner is lowered back into the borehole and the entire assembly is then advanced to the next depth interval. Thus, top-down sampling requires pulling the tooling after each sample interval, decontaminating the tooling, re-setting the groundwater sampler, and advancing the tooling to the next planned interval.

The advantages of this approach are that it allows grouting of the borehole from the bottom of the borehole and reduces the potential for cross-contamination from adjacent sampling intervals.

The primary disadvantage is that the entire process is much less time-efficient per borehole since the tooling must be retracted and re-advanced every time.

NOTE: *Top-down is the preferred method for PFAS VAP sampling.*

8.2 Sonic Drilling VAP Sampling

For sites with deep unconsolidated aquifers, bedrock/weathered bedrock, or otherwise challenging drilling conditions (e.g., presence of dense tills, caliche, cobbles), sonic drilling will be necessary to complete VAP. Like direct push, groundwater profilers can be used with sonic rigs to collect multiple depth-discrete groundwater samples biased towards transport zones based on soil lithological cores. The configuration of individual samplers varies based on their manufacturer by different drilling contractors (e.g., Cascade Push Ahead/Packer Isolation Groundwater Profiler or Geoprobe® SP-60).

The overall strategy of sonic drilling VAP sampling is consistent with direct push VAP sampling; however, drilling with sonic or some rotary methods can require the introduction of drilling fluid/water that can potentially affect the integrity of the groundwater sample. If possible, sonic drilling for VAP borings will be conducted without the use of drilling water. If, for example, the geology is known for flowing sands or VAP is required deep below the water table, drilling water will be used to keep the core barrel free inside the outer drill casing. In this case it is recommended that a visible dye be used to spike the drilling water to assist with purging of the VAP interval. The VAP interval is then purged until the visible dye is no longer visible, or less the 10% of the starting concentration. For more on drilling with visible dye, see Section 8.2.3. Sonic VAP sampling is typically performed in a top-down manner using either a push ahead sampling device or a packer system.

8.2.1 Push-Ahead Groundwater Profiler

Push-ahead groundwater sampling devices are available through Cascade Drilling and other sonic drillers and consists of a stainless-steel sheathed "screen" threaded to the base of the sonic drill rod. The device is driven ahead of the sonic casing into the undisturbed formation to the prescribed sample depth interval. Once the point is at the specified interval, the threaded portion between the profiler and rod is partially unthreaded to expose the water ports to allow native formation water to enter the profiler. A groundwater sample is then obtained using either a stainless-steel bailer or pump with tubing depending on the DQOs. The interval is typically purged until relatively free of fine-grained material.

The disadvantage of using this device is that groundwater samples are obtained from undisturbed native formation with unknown soil lithology, so sampling is conducted "blind". Therefore, it is recommended that a pre-existing lithological log from an adjacent borehole is used to determine sampling depth intervals.

8.2.2 Packer Isolation Groundwater Profiler

Packer Isolation groundwater profilers (e.g., Packer Isolation groundwater profiler from Cascade, Geoprobe ® SP-60 Sonic Groundwater Profiler) work by driving the casing over the soil core, retrieving the soil core barrel, and then lowering a stainless screen and packer assembly to the base of the sonic casing. The sonic outer casing is then extracted to expose the screen to the formation, and the packer is inflated within the casing above the screen to isolate the screened interval from any water that might be above the packer in the sonic casing. A groundwater sample can then be collected from the screen.

The biggest advantage of this device is that groundwater sampling depth intervals can be determined based on lithological logs obtained from the same borehole.

A disadvantage is that a large volume of purge water may need to be removed to clear the borehole of water introduced from above.

8.2.3 Drilling with Visible Dye

Potable water is commonly used as a drilling fluid during drilling to remove cuttings of geologic materials from the borehole (e.g., coring or roller-bit rotary drilling), cool the drill bit (e.g., sonic drilling), and/or maintain sufficient hydraulic pressure within the drilling tools to prevent heaving of aquifer solids into the drill casing(s).

Typically, if groundwater sampling is performed during drilling, the purge volume to be removed is at least as much as was lost during drilling. However, accurately determining the volume of water lost to the formation, or to specific intervals of the borehole, is not always feasible or possible.

To ensure that groundwater samples accurately represent groundwater quality of the surrounding formation and are not significantly influenced by unrecovered drilling fluid, fluorescein dye can be added to the drilling water to visually confirm when unimpacted native groundwater enters the borehole and can be sampled.

The target concentration of dye is approximately 20 mg/L, which is greater than two (2) orders of magnitude above its visual threshold (approximately 0.1 mg/L) and over five (5) orders of magnitude above its typical laboratory detection limit (less than 0.001 mg/L). Once the drilling tool has been advanced to the prescribed depth for groundwater sampling, water will be pumped from the borehole until the discharge water is relatively clear of fluorescein. The goal of purging is to reach the clarity of a prepared visual standard, indicating that the discharge water is comprised of at least 95 percent formation water and less than 5 percent drilling water. Groundwater samples will then be collected for COC analysis.

If the visual standard is still not reached after a reasonable period and volume of purging, then COC sampling can still be performed, provided that samples of the dyed drilling water and groundwater are also sent for fluorescein analysis. The fluorescein data can then be used to calculate a correction factor to be applied to COC analytical results.

8.2.3.1 Set-Up Procedures

a. Dye Batch Preparation

- Prior to initiating drilling activities, measure the proper mass of powdered dye for mixing with drilling water - 38 grams of fluorescein (provided by Ozark Underground Laboratory) will be added to every 500 gallons of water to yield an average tracer concentration of approximately 20 mg/L.
- If the drilling water “batch” is larger or smaller than 500 gallons, the same ratio of dye to drilling water will be used.
- Measure the mass of dye using a scale with an accuracy of +/- 1 gram.
- Add the dye to the drilling water batch tank while also adding the potable water to provide agitation to assist in mixing the dye.
- A utility pump is also recommended to mix the tracer with the drilling water by recirculating water in the tank for at least 15 minutes.

- Place 40 mL of the dyed drilling water into a 50 mL graduated cylinder for use in preparing the visual standard discussed below.
- Collect four (4) additional 40 ml unpreserved VOA vials of drilling water from each batch of drilling water – label all four of these vials “DW1” for the first batch of drilling water, “DW2” for the second batch, etc. These samples will be archived for potential use in preparing other standards with other dilutions (optional) or for submittal for laboratory analysis, if necessary.

b. Preparation of Visual Standard: A visual standard will be prepared for each batch of dyed drilling water, as follows.

- Pour the 40 mL volume of dyed drilling water from the 50 mL graduated cylinder into a 1 L graduated cylinder.
- Add 760 mL of un-dyed potable water (from the same potable water source used to prepare the dyed drilling water) to the 1 L graduated cylinder to produce 800 mL of “visual standard”.
- Fill one 40-mL unpreserved VOA vial with visual standard solution and label this “VS1” for the visual standard from the first batch of drilling water, “VS2” for the visual standard from the second batch of drilling water, etc.
- These visual standards represent a 95% dilution of the drill water and will provide a visual standard to verify that sufficient purging has been performed to remove at least 95% of the drilling water from a given interval, indicating that the purge water consists of at least 95% formation water.
- Discard the remaining fluid within the graduated cylinder using an appropriate container.
- Photograph the “DW” samples and the “VS” sample from each batch of drilling water with adequate, consistent light, against a white background.
- Keep all the dyed drilling water (“DW”) samples and visual standard (“VS”) samples in a cooler to keep them dark as the dye will degrade with exposure to light.

8.2.3.2 Drilling Procedures

- Fresh drilling water from the dyed drilling water batch tank will be used during drilling operations. In general, a positive head will be maintained during drilling, which should prevent dilution of the drilling water by formation water. However, any water upwelling from the casing during drilling will be contained in a tub positioned over the borehole. As needed, recovered water in the tub will be pumped to a frac tank.
- The drilling water source will be sampled for chlorine and pH at the start of the project. Chlorine, if present in detectable quantities, will consume fluorescein; therefore, wait a period of at least four (4) hours between dye addition and sampling (and use) of the drilling fluid. Below pH values of about 5, fluorescein will have reduced fluorescence. Depending on the source of the drilling fluid and project objectives, the source water may also be sampled for COCs and fluorescein.
- In open sunlight, fluorescein photodegrades rapidly. If the tracer batch tank is translucent, use 1-millimeter (mm) thick black plastic to cover the tank during the day to minimize photodegradation of the tracer batch water.
- After tracer addition, each batch of drilling fluid will be sampled at least once for fluorescein.
- At the end of the day, any excess tracer batch water can be stored for use on the following day, or it may be disposed of as investigation derived waste. Alternatively, fluorescein concentrations can be reduced to below

visible concentrations with granular activated carbon, UV-oxidation, chemical oxidants, or direct exposure to sunlight for several days.

- The field geologist will record the amount of drilling water lost to the formation during drilling of each sampling depth interval.
- At the end of the project, any excess tracer batch water can be disposed of as investigation derived waste. Alternatively, fluorescein concentrations can be reduced to below visible concentrations with granular activated carbon, UV-oxidation, chemical oxidants, or direct exposure to sunlight for several days. Depending on project and regulatory requirements, excess batch water with fluorescein concentrations below the visible limit could be discharged to a sanitary sewer or other discharge location.

8.2.3.3 Purging and Sampling Procedures

- After a groundwater sampling interval is reached, purging and screening-level groundwater sampling will be performed.
- The target sample interval will be purged using a pump, and during purging, purge water will be periodically collected in a 40-mL unpreserved VOA vial and compared to the visual standard ("VS" sample) prepared from the drilling water used to drill that depth interval.
- If the purge water contains significant suspended particulates/turbidity, it may be necessary to allow particulates to settle before comparing the purge water sample to the visual standard.
- Purging will continue until *one* of the following two conditions is met:

    1) Purge water clarity (in terms of remaining dye content) matches or exceeds the clarity of the visual standard, indicating that the purge water consists of at least 95% formation water.

        a. In this case, the purge water sample and the associated visual standard will be photographed against a white background to document that the purging goal has been reached.

OR

    2) A different practical purging limit has been reached, based on purge volume or time

        a. In this case, the purge water sample and the associated visual standard will be photographed against a white background to document the degree of purge water visual clarity that was attained

        b. Also, a sample of the purge water will be collected in a 40 mL unpreserved VOA; this sample and one of the vials of dyed drilling water will be submitted to Ozark Underground Laboratories for quantitative analysis of fluorescein. These samples will be shipped in a cooler with reusable "Blue Ice" rather than wet ice. The analytical results for fluorescein will be used to calculate a COC correction factor, as discussed below (see Section 8.2.3.4).

- After purging has been completed, screening-level groundwater samples will be collected from the discharge end of the pump tubing for COC analysis in accordance with the approved work plan.

8.2.3.4 Calculation of Correction Factor

- If the purge water does not reach the goal indicated by the visual standard ("VS" sample), a sample of the drilling water and a sample of the purge water (obtained immediately prior to sampling for COC analysis) will be sent for laboratory analysis of fluorescein.
- Representative COC concentrations in groundwater (C_{gw}) can then be calculated as:

$$C_{gw} = C_m \, [F_d / (F_d - F_s)]$$

where: C_m = measured COC concentration, as reported by the lab

F_d = fluorescein concentration in drilling water

F_s = fluorescein concentration in groundwater sample

- The term $[F_d / (F_d - F_s)]$ is the COC correction factor.

8.3 Boring Abandonment

Upon completion, each top-down borehole is backfilled with bentonite grout from the terminal end of the boring upward. The top portion of each boring is sealed with asphalt or concrete to match the existing grade. Each bottom-up borehole is typically abandoned by the collapse as the rods are retraced.

Borehole abandonment requirements in some geographies dictate top-down sampling; this should be verified in advance of work and outlined in the FIP/Work Plan. See also *TGI for Monitoring Well and Borehole Decommissioning.*

9 Waste Management

Investigation derived waste (IDW) (e.g., soil cuttings and decontamination water generated during cleaning procedures) will be collected and contained on site in appropriate containers: see the *TGI – Investigation- Derived Waste Handling and Storage* for details (Arcadis 2020d). All IDW generated during field activities will be placed in Department of Transportation approved containers, sealed, and labeled. Containerized IDW will be stored on site until it is profiled and subsequently transported to an approved facility for disposal or recycling.

Personal protective equipment (e.g., gloves, disposable clothing, disposable equipment) resulting from personnel cleaning procedures and soil sampling activities will be placed in plastic bags. These bags will be transferred into appropriately labeled containers for appropriate disposal.

Waste manifests for all IDW suspected to have come into contact with PFAS will clearly note the potential presence of PFAS.

Additional IDW sampling and management details will be provided in the site-specific FIP/Work Plan/QAPP addendum and will be consistent with applicable client and state requirements.

10 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

The supervising field lead will be responsible for documenting drilling events and for recording all relevant information in a clear and concise format. The record of drilling events will include (at a minimum):

- Start and finish drilling dates
- Project name and location
- Project number, client, and site location
- VAP boring number and depths
- Depth to water
- Type of VAP performed and associated tools
- Core barrel size
- Names of contractor's drillers, inspectors, or other people onsite
- Weather conditions

Field staff will ensure COC Forms are properly completed and will verify which analytes (including PFAS analytes) are required for analysis and note on the COC.

Waterproof field books must not be used for field notes. Instead, it's recommended that field notes be on loose paper on Masonite, plastic, or aluminum clip boards and/or electronic data collection tablets (as required). Other requirements for field notes include:

- Keep field notes, writing implements, and electronic data collection tablets away from samples and sampling materials; and,
- Do not write on sampling bottles unless they are closed.

11 Quality Assurance

In general, the following quality assurance and quality control (QA/QC) samples will be collected:

- Equipment blanks
- Field duplicates
- Field (i.e., reagent) blanks

- Matrix spike/matrix spike duplicate

Details on QC sampling requirements (e.g., frequency of collection, types of QA/QC samples) are provided in the QAPP and/or FIP/Work Plan. Additionally, detailed procedures related to equipment and field (i.e., reagent) blank sample collection are outlined in the *TGI for Equipment and Reagent Blank Sample Collection for PFAS Analysis*.

In general, equipment blanks should be collected from every piece of downhole equipment that could come into contact with soil or groundwater during sample collection. This includes the profiling tools (e.g., Geoprobe® SP-16, Geoprobe® SP-22, Geoprobe® SP-60, Cascade Packer Isolation Groundwater Profiler).

To avoid cross-contamination during drilling and sampling, reusable equipment such as hand tools will be cleaned using a non-phosphate soap free of VOCs, double-rinsed in potable water, and allowed to air dry prior to re-use. Drive casings and other drilling equipment will be steam cleaned or replaced with new equipment between boreholes. The drilling equipment will be cleaned in an area designated by the supervising engineer or geologist that is located outside of the work zone.

Prior to initiating field activities, water sources to be used during drilling activities will be sampled to verify those sources are PFAS-free to the extent possible.

Refer to quality control requirements for the project to ensure that appropriate quality assurance and quality control (QA/QC) samples are collected. When collecting QA/QC samples, the same guidelines apply as when collecting regular samples – specifically that:

- Samples will be collected in laboratory-supplied HDPE bottles
- Bottle caps must remain in the hand of the sampler until replaced on the bottle
- Labels must be completed after the caps have been placed back on each bottle
- Samples must be stored in appropriate transport bottles (coolers) with ice (Ziplock-type bags for use as ice containers) with appropriate labeling
- Do not use blue ice except for shipping fluorescein samples
- Store PFAS samples in a separate cooler from other types of samples

11.1 Equipment Blanks (if relevant)

QA/QC sampling typically includes daily collection of equipment blanks using the laboratory-supplied water, or in the case of PFAS sampling, “PFAS-free” water. For peristaltic pump tubing, laboratory supplied water will be poured into a clean HDPE sample bottle and then pumped through new HDPE tubing using the peristaltic pump (with new silicone tubing). Equipment blanks will also be collected from the water used by drillers, as well as any downhole tooling to ensure absence of any cross-contamination. Drilling water sources must be submitted for analysis of all COCs before work commences for VAP as discussed above. See *also TGI for Poly- and Perfluorinated Alkyl Substances (PFAS) Potable Water Sampling Guidance*.

11.2 Field Duplicates

QA/QC sampling typically includes the collection of one field duplicate for every 10 or 20 samples collected. Each duplicate sample will be collected immediately after the initial sample of which it is a duplicate into a separate laboratory-provided sample bottle. Do not indicate to the laboratory which sample the duplicate replicates (i.e., it will be given a blind reference on the COC and sample name such as “Dup 1”).

11.3 Field Blanks

QA/QC sampling for typically includes the submission of one laboratory supplied field blank per day. The reagent field blank sample is brought to the site in a laboratory-supplied sample bottle. Field staff transfer the laboratory-supplied reagent blank to an empty sample bottle. This reagent field blank will be placed in the same cooler as the other PFAS samples.

11.4 Matrix Spikes (optional in some cases)

QA/QC sampling includes submitting a sample to be used as a matrix spike if the project requires it. If a separate sample bottle is required, an additional sample will be collected immediately after the initial sample of which it is a duplicate into a separate laboratory-supplied sample bottle.

11.5 Laboratory Analytical QA/QC

- Internal laboratory QA/QC will consist of one laboratory blank and one laboratory control sample (or blank spike) per batch of samples, and additional QA/QCs as indicated by the laboratory QA/QC procedures. Isotope dilution will be used for quantification with isotope-labeled surrogate standards, as available.
- For groundwater and surface water samples, extract the entire groundwater and surface water sample and at least two sampling bottle solvent rinsates for analysis to increase sample accuracy. Avoid sub-sampling an aliquot of the sample bottle.
- Soil samples will be analyzed in their entirety or thoroughly homogenized before extraction and analysis.
- As part of the internal QA/QC, relative percent difference will be calculated between samples and corresponding field or laboratory duplicates. The laboratory quality assurance portion of the laboratory certificates will be reviewed to verify that all calculations/recoveries were within acceptable limits as established by the laboratory method.
- In January 2017, the U.S. Department of Defense and U.S. Department of Energy Quality Systems Manual (QSM) 5.1 (U.S. Department of Defense 2017) was finalized and introduced laboratory guidance for the measurement of PFAS in matrices other than drinking water. This guidance is not a detailed procedural method such as an U.S. Environmental Protection Agency method, but it does recommend best practices around the analysis of PFAS. Laboratories are not required to comply with QSM 5.1 until 2019, although the recommendations around PFAS analysis are similar to what most laboratories are already implementing. Arcadis recommends that any request for PFAS analysis in

groundwater or soil should specifically reference the need to comply with Table B-15 in the QSM 5.1 (i.e., Per- and Polyfluoroalkyl Substances (PFAS) Using Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) With Isotope Dilution or Internal Standard Quantification in Matrices Other Than Drinking Water); however, this list can be modified to support project specific deliverables.

12 References

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ATTACHMENT 1

Table 1 and Table 2: PFAS Investigation Material Recommendations

Table 1: Summary of Acceptable Sampling Equipment and Materials for PFAS Site Investigations

Sampling Materials	Additional Considerations	References
Water Sampling Materials		
High density polyethylene (HDPE) or silicone tubing materials	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
HDPE HydraSleeves™	Low density polyethylene (LDPE) HydraSleeves™ are not recommended	USACE 2016; MassDEP 2017
Drilling and Soil Sampling Materials		
PFAS-free drilling fluids	--	DER 2016
PFAS-free makeup water	Confirm PFAS-free water source via laboratory analysis prior to investigation	--
Acetate liners	For use in soil sampling	USACE 2016
Sample Containers and Storage		
HDPE sample containers with HDPE lined lids for soil and water samples	Laboratory should provide; whole bottle analysis of aqueous samples combined with a solvent rinse of bottle is recommended	DER 2016, MassDEP 2017
Ice contained in plastic (polyethylene) bags (double bagged)	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Field Documentation		
Sharpie®	--	NHDES 2016; USACE 2016; MassDEP 2017
Ball point pens	--	MassDEP 2017
Standard paper and paper labels	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Decontamination		
Water-only decontamination	Confirm PFAS-free water source via laboratory analysis prior to investigation	DER 2016
Alconox®, Liquinox® or Citranox® followed by deionized water or PFAS-free water rinse	Alconox® known to contain trace levels of 1,4-dioxane	NHDES 2016; USACE 2016; MassDEP 2017
Methanol, isopropanol, or acetone	Special health and safety precautions are necessary	UNEP 2015; USACE 2016

Note: This list is considered preliminary and additional materials may be added as additional information becomes available. Project teams are expected to follow a methodical evaluation process of materials to be used and confirm acceptance prior to implementation of field activities.

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Table 2: Summary of Equipment and Materials Not Recommended for PFAS Site Investigations.

Sampling Materials	Known PFAS-Containing Materials	Suspected PFAS-Containing Materials	Materials with Potential to Retain PFASs	References
Water Sampling Materials				
Teflon® or polytetrafluoroethylene (PTFE)-containing or coated field equipment (e.g., tubing, bailers, tape, plumbing paste)	x			DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Passive diffusion bags			x	MassDEP 2017
LDPE HydraSleeves ™			x	USACE 2016; MassDEP 2017
Water particle filters			x	MassDEP 2017
Drilling and Soil Sampling Materials				
Aluminum foil			x	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Drilling fluid containing PFASs	x	x		DER 2016
Sample Containers and Storage				
Glass sample containers with lined lids			x	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
LDPE containers and lined lids			x	USACE 2016
Teflon® or PTFE- lined lids on containers (e.g., sample containers, rinsate water storage containers)	x			DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Reusable chemical or gel ice packs (e.g., BlueIce®)		x		DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Field Documentation				
Self-sticking notes and similar office products (e.g., 3M Post-it-notes)		x		DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Waterproof paper, notebooks, and labels	x			DER 2016, MassDEP 2017
Non-Sharpie® markers		x		NHDES 2016
Decontamination				
Some detergents and decontamination solutions (e.g., Decon 90® Decontamination Solution)	x	x		DER 2016; NHDES 2016; MassDEP 2017

Note: For materials that are suspected of containing PFASs, or have the potential to retain PFASs, project specific considerations may provide adequate justification for use during the field event. For example, further evaluation may be conducted in the form of pre-field equipment blank sample analysis.

ATTACHMENT 2

Safety Data Sheet (SDS) Fluorescein

SAFETY DATA SHEET (SDS)
REVISION DATE: 03/03/2016

HUE CORPORATION

Color your everything, may your Hue come true

SECTION I. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

PRODUCT IDENTIFIER:

PRODUCT NAME ……………………….. **HUE URANINE CONC** (Also known as Fluorescein)
PRODUCT NUMBER ……………….. 1-C8-073PC
COLOR INDEX NAME ………………. ACID YELLOW 073
COLOR INDEX NO …………………….. 45350
C. A. S. # ……………………………. 518-47-8
CHEMICAL FAMILY…………………. XANTHENE

INTENDED USE OF THE PRODUCT:

FELT TIP, MARKER INKS, WATER BASED COATINGS AND LEAK DETECTION

NAME, ADDRESS AND TELEPHONE OF RESPONSIBLE PARTY:

HUE CORPORATION	TELEPHONE	714-389-3130
P.O. BOX 509	FAX	714-389-9731
TUSTIN, CA 92781	EMAIL	SUPPORT@HUECORPORATION.COM

EMERGENCY TELEPHONE NUMBER:

CHEMTREC (USA)	1-800-424-9300
CHEMTREC (OUTSIDE USA)	1-703-527-3887

SECTION 2. HAZARD(S) IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:

GHS-US
ACUTE TOX. - INHALATION (CATEGORY 5)
EYE DAM./IRRITATION (CATEGORY 2B)
SKIN CORR./IRRITATION (CATEGORY 3)

GHS LABELING:

HAZARD PICTOGRAMS (GHS-US):	NO SYMBOL
SIGNAL WORD	WARNING
HAZARD STATEMENT(S)	H333 - MAY BE HARMFUL IF INHALED H320 - CAUSES EYE IRRITATION H316 - CAUSES MILD SKIN IRRITATION
PRECAUTIONARY STATEMENTS	P305 + 351 + P338 - IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES IF PRESENT AND EASY

TO DO. CONTINUE RINSING.
P337 + P313 - IF EYE IRRITATION OCCURS/PERSISTS:
GET MEDICAL ADVICE AND ATTENTION.
P261 - AVOID BREATHING DUST/FUMES/GAS/MIST/VAPORS/SPRAY
P264 - WASH FACE THOROUGHLY AFTER HANDLING.
P322 + P313 - IF SKIN IRRITATION OCCURS: GET MEDICAL ADVICE/ ATTENTION.
P304 + 312 - IF INHALED: CALL A POISON CENTER/DOCTOR/PHYSICIAN IF YOU FEEL UNWELL

OTHER HAZARDS	NO DATA AVAILABLE
UNKNOWN ACUTE TOXICITY	NO DATA AVAILABLE

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

DESCRIPTION OF MIXTURE: PROPRIETARY MIXTURE OF DYES.

SUBSTANCE:

NAME	C.A.S.#	WEIGHT 100%	GHS-US CLASSIFICATION
ACID YELLOW 073	518-47-8	100%	ACUTE TOX. - INHALATION (CATEGORY 5) EYE DAM./IRRITATION (CATEGORY 2B) SKIN CORR./IRRITATION (CATEGORY 3)

SECTION 4. FIRST AID MEASURES

FIRST AID MEASURES GENERAL:

INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GIVE OXYGEN AND GET IMMEDIATE MEDICAL ATTENTION.

SKIN: WASH WITH MILD SOAP AND WATER. IF IRRITATION OCCURS GET MEDICAL ATTENTION. IF CLOTHING IS CONTAMINATED, RE-MOVE AND WASH BEFORE REUSE.

EYES: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS APART FOR THOROUGH IRRIGATION. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION: INDUCE VOMITING - SEEK IMMEDIATE MEDICAL ATTENTION.

MOST IMPORTANT SYMPTOMS AND EFFECTS, ACUTE AND DELAYED:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY HAZARDOUS COMMUNICATION STANDARD. HOWEVER, AS WITH ALL CHEMICAL; HANDLE WITH CARE, AVOID EYE AND SKIN CONTACT, AVOID INHALATION OF DUSTS OR VAPORS. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED.

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

WATER, DRY CHEMICAL, CARBON DIOXIDE, FOAM.

SPECIAL HAZARDS ARISING FROM SUBSTANCE OR MEDIA:

FIREFIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS TO GUARD AGAINST POTENTIALLY TOXIC AND IRRITATING FUMES. AVOID DUSTING. DUST CAN FORM EXPLOSIVE MIXTURES WITH AIR.

PROTECTION/ADVICE FOR FIREFIGHTER(S):

BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

REMOVE PERSONS FROM DANGER AREA.

ENVIROMENTAL PRECAUTIONS:

AVOID ANY UNCONTROLLED RELEASE OF MATERIAL. DO NOT EMPTY INTO DRAINS OR THE AQUATIC ENVIRONMENT.

EMERGENCY PROCEDURES:

NO ADDITIONAL INFORMATION

METHODS AND MATERIALS FOR CONTAMINENT AND CLEANING UP:

WHERE SPILLS ARE POSSIBLE, A COMPREHENSIVE SPILL RESPONSE PLAN SHOULD BE DEVELOPED AND IMPLEMENTED. AVOID ANY UNCONTROLLED RELEASE OF MATERIAL.

UTILIZE RECOMMENDED PROTECTIVE CLOTHING AND EQUIPMENT (SEE SECTION 8).
SPILLS SHOULD BE SWEPT UP USING AN ABSORBENT DUST CONTROL PRODUCT AND PLACED IN CONTAINERS. SPILL AREA CAN BE WASHED WITH WATER. COLLECT WATER FOR APPROVED DISPOSAL.
IN THE EVENT OF UNCONTROLLED RELEASE OF THIS MATERIAL, THE USER SHOULD DETERMINE IF THE RELEASE IS REPORTABLE UNDER APPLICABLE LAWS AND REGULATIONS.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:

HANDLE WITH CARE. AVOID OVER EXPOSURE. USE NIOSH/OSHA APPROVED RESPIRATOR, WORK GLOVES, AND CLOTHING. WASH AFTER HANDLING. SENSITIVE INDIVIDUALS MAY EXPERIENCE RESPIRATORY ALLERGIES. MAY CAUSE SKIN IRRITATION. USE WITH LOCAL VENTILATION.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:

USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.

KEEP AWAY FROM HEAT. KEEP AWAY FROM SOURCES OF IGNITION.

KEEP AWAY FROM STRONG OXIDIZING AND REDUSING AGENTS.

SPECIFIC END USES:

FELT TIP, MARKER INKS, WATER BASED COATINGS AND LEAK DETECTION

SECTION 8. EXPOSURE CONTROLS /PERSONAL PROTECTION

CONTROL PARAMETERS:

INGREDIENTS WITH LIMIT VALUES THAT REQUIRE MONITORING AT THE WORKPLACE - NOT REQUIRED

EXPOSURE CONTROLS:

APPROPRIATE ENGINEERING CONTROLS - THE USUAL PRECAUTIONARY MEASURES ARE TO BE ADHERED TO WHEN HANDLING CHEMICALS.

PERSONAL PROTECTIVE EQUIPMENT:

HAND PROTECTION	WEAR IMPERMEABLE RUBBER OR PLASTIC GLOVES
EYE PROTECTION	TIGHTLY SEALED SAFETY GOGGLES OR FULL FACE SIDE SHIELDS.
SKIN AND BODY	APRON, COVERALLS AND NON-LEATHER SOLED WORK SHOES. WASH DYE CONTAMINATED CLOTHES AND SKIN WITH MILD SOAP AND DETERGENTS.
RESPIRATORY	WEAR OSHA/NIOSH APPROVED DUST MASK/RESPIRATOR
HYGIENE MEASURES	HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. WASH HANDS AFTER HANDLING MATERIAL.
OTHER PROTECTION	DELUGE SAFETY SHOWER AND EYE WASH STATION SHOULD BE LOCATED NEAR WORK AREA.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES :

APPEARANCE, COLOR, ODOR	YELLOW POWDER, NO ODOR
pH	8.0 - 9.0
MELTING POINT/FREEZING POINT	ND
INITIAL BOILING POINT/BOILING RANGE	0.00
FLASHPOINT	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE
EVAPORATION RATE	NO DATA
FLAMMABILITY (SOLID,GAS)	NORMALLY STABLE, NOT COMBUSTIBLE NOR FLAMMABLE
UPPER EXPLOSIVE LIMITS	NA
LOWER EXPLOSIVE LIMITS	NA
VAPOR PRESSURE	NA
VAPOR DENSITY	NA
RELATIVE DENSITY	NA
SOLUBILITY IN WATER	SOLUBLE
PARTITION COEFFICIENT N-OCTANOL/WATER	NO DATA

AUTO-IGNITION TEMPERATURE	NO DATA
DECOMPOSITION TEMPERATURE	NO DATA
VISCOSITY, DYNAMIC	NO DATA
VISCOSITY, CINEMATIC	NO DATA
EXPLOSIVE PROPERTIES	N/A
OXIDIZING PROPERTIES	NA
OTHER INFORMATION	NA

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY STABLE UNDER NORMAL STORAGE AND HANDLING CONDITIONS.
CONDITIONS TO AVOID OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
INCOMPATIBLE MATERIALS OXIDIZING & REDUCING AGENTS MAY DESTROY COLOR.
HAZARDOUS DECOMPOSITION PRODUCTS - CO, CO2, OXIDES OF NITROGEN AND OTHER POTENTIALLY TOXIC FUMES.

SECTION 11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL EFFECTS :

ORAL (ANIMAL GREATER THAN 7,000 MG/KG - RAT
DERMAL (ANIMAL) NA
EFFECTS TO EYES (ANIMAL) EYES - RABBIT, NOT IRRITATING
SKIN IRRITATION (ANIMAL) SKIN - RABBIT, SLIGHT IRRITANT

SKIN CORROSION/IRRITATION NOT CLASSIFIED
SERIOUS EYE DAMAGE/IRRITATION CAUSES EYE IRRITATION
RESPIRATORY OR SKIN SENSITIZATION NOT CLASSIFIED
GERM CELL MUTAGENICITY NOT CLASSIFIED
CARCINOGENICITY NOT CLASSIFIED
REPRODUCTIVE TOXICITY NOT CLASSIFIED
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) MAY CAUSE DROWSINESS OR DIZZINESS.
ASPIRATION HAZARD NOT CLASSIFIED
INHALATION MAY CAUSE DROWSINESS OR DIZZINESS.
EYE CONTACT CAUSES SERIOUS EYE IRRITATION.
INGESTION INGESTION MAY CAUSE NAUSEA, VOMITING AND DIARRHEA

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY NA
PERSISTENCE AND DEGRADABILITY NA
BIOACCUMULATIVE POTENTIAL NA
MOBILITY IN SOIL LC-50 (LETHAL CONCENTRATION) UG = MICROGRAMS/LITER CHANNEL CATFISH - 2,267,000 UG/LITER RAINBOW TROUT - 1,372,000 UG/LITER BLUEGILL - 3,433,000 UG/LITER
OTHER ADVERSE EFFECTS NA

SECTION 13. DISPOSAL CONSIDERATION

WASTE DISPOSAL RECOMMENDATION :

EMPTY BAGS THOROUGHLY. CARRY OUT THE PROPER RECYLING, REUSAGE OR DISPOSAL.
PLEASE REFER TO THE RELEVANT EU REGULATIONS, IN PARTICULAR THE GUIDELINES/DECISIONS OF THE COUNCIL REGARDING HANDLING OF WASTES (E.G. 75/442/EEC, 91/689/EEC, 94/67/EC, 94/904/EC) AS IMPLEMENTED IN NATIONAL REGULATIONS.

REGIONAL RECOMMENDATION :

BURY OR INCINERATE ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

CONTAINERS SHOULD NOT BE REUSED WITHOUT PROFESSIONAL CLEANING AND RECONDITIONING.
OBSERVE ALL LABELED SAFEGUARDS UNTIL CLEANED, RECONDITIONED OR DESTROYED.

PLEASE REFER TO SECTION 8 (EXPOSURE CONTROLS /PERSONAL PROTECTION) OF THIS SDS.

SECTION 14. TRANSPORTATION INFORMATION

UN NUMBER NONE
UN PROPER SHIPPING NAME NONE

DEPARTMENT OF TRANSPORTATION (DOT) : NOT HAZARDOUS FOR TRANSPORTATION

TRANSPORT HAZARD CLASS(ES)

HAZARD LABLES (DOT) :

PACKING GROUP (DOT) NA
DOT SPECIAL PROVISIONS NA

ADDITIONAL INFORMATION:

OVERLAND TRANSPORT NONE
TRANSPORT BY SEA NONE
AIR TRANSPORT NONE
DOT QUANTITY LIMITATIONS PASSENGER AIRCRAFT NA
DOT QUANTITY LIMITATIONS CARGO AIRCRAFT NA

SECTION 15. REGULATORY INFORMATION

US FEDERAL REGULATIONS:

THE SUBSTANCES IS LISTED ON UNITED STATES TSCA (TOXIC SUBSTANCE CONTROL ACT) INVENTORY.

US STATE REGULATIONS:

NONE

CHEMICAL IDENTITY:

518-47-8	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	CHINA	KECL	PICCS	AICS
	X	-	-	-	-	-	-	-	-	-

TSCA STATUS	IN COMPLIANCE
E C CLASSIFICATION	(67/548/EEC - 88/379/EEC) N/A
EINECS NUMBER	
REACH CLASSIFICATION	
R PHRASES	
ADDITIONAL REGULATORY INFORMATION	

SECTION 16. OTHER INFORMATION

INDICATION OF CHANGES:

NA

OTHER INFORMATION:

NA

GHS FULL TEXT PHRASES:

MAY BE HARMFUL IF INHALED	H333
CAUSES EYE IRRITATION	H320
CASUES MILD SKIN IRRITATION	H316

	HEALTH	FLAMMABILITY	REACTIVITY	PERSONAL PROT
H. M. I. S. CLASSIFICATION:	1	0	0	D

HMIS CODE: **4** - SEVERE HAZARD, **3** - SERIOUS HAZARD, **2** - MODERATE HAZARD, **1** - SLIGHT HAZARD, **0** - MINIMAL HAZARD

SAFETY DATA SHEET (SDS)
REVISION DATE: 03/03/2016

ATTACHMENT 3

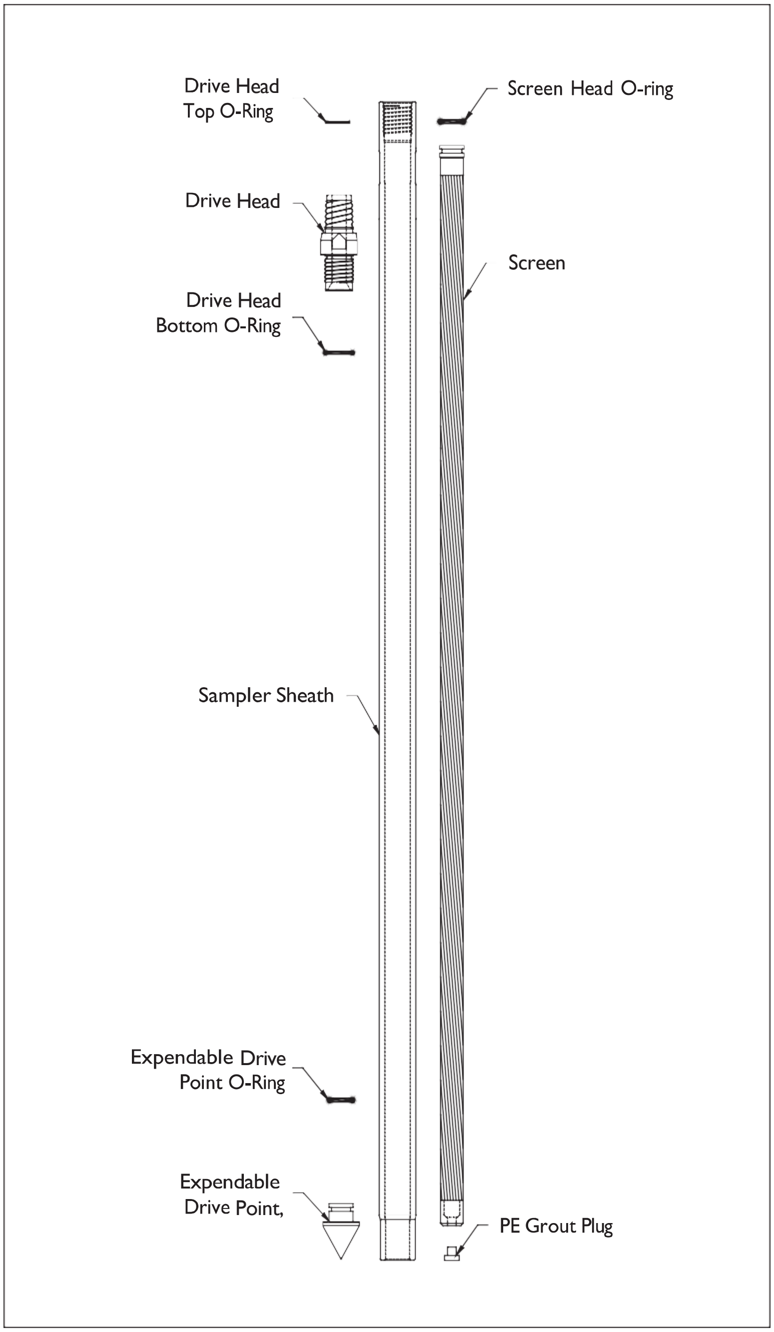
SOPs Geoprobe® Screen Point 16 and Screen Point 22 Groundwater Samplers

Geoprobe® Screen point 16 Groundwater Sampler

Standard OperatinG procedure

Technical Bulletin No. MK3142

PREPARED: November, 2006



GEOPROBE® SCREEN POINT 16 GROUNDWATER SAMPLER PARTS

Geoprobe® and Geoprobe Systems®, Macro-Core® and Direct Image® are Registered Trademarks of Kejr, Inc., Salina, Kansas

Screen Point 16 Groundwater Sampler is manufactured under U.S. Patent 5,612,498

1.0 OBJECTIVE

The objective of this procedure is to drive a sealed stainless steel or PVC screen to depth, deploy the screen, obtain a representative water sample from the screen interval, and grout the probe hole during abandonment. The Screen Point 16 Groundwater Sampler enables the operator to conduct abandonment grouting that meets American Society for Testing and Materials (ASTM) Method D 5299 requirements for decommissioning wells and borings for environmental activities (ASTM 1993).

2.0 BACKGROUND

2.1 Definitions

Geoprobe®: A brand name of high quality, hydraulically powered machines that utilize both static force and percussion to advance sampling and logging tools into the subsurface. The Geoprobe® brand name refers to both machines and tools manufactured by Geoprobe Systems®, Salina, Kansas. Geoprobe® tools are used to perform soil core and soil gas sampling, groundwater sampling and monitoring, soil conductivity and contaminant logging, grouting, and materials injection.

Screen Point 16 (SP16) Groundwater Sampler: A direct push device consisting of a PVC or stainless steel screen that is driven to depth within a sealed, steel sheath and then deployed for the collection of representative groundwater samples. The assembled SP16 Sampler is approximately 51.5 inches (1308 mm) long with an OD of 1.625 inches (41 mm). Upon deployment, up to 41 inches (1041 mm) of screen can be exposed to the formation. The Screen Point 16 Groundwater Sampler is designed for use with 1.5-inch probe rods and machines equipped with the more powerful GH60 Hydraulic Hammer. Operators with GH40 Series hammers may chose to use this sampler in soils where driving is difficult.

Rod Grip Pull System: An attachment mounted on the hydraulic hammer of a direct push machine which makes it possible to retract the tool string with extension rods or flexible tubing protruding from the top of the probe rods. The Rod Grip Pull System includes a pull block with rod grip jaws that are bolted directly to the machine. A removable handle assembly straddles the tool string while hooking onto the pull block to effectively grip the probe rods as the hammer is raised. A separate handle assembly is required for each probe rod diameter.

2.2 Discussion

In this procedure, the assembled Screen Point 16 Groundwater Sampler (Fig. 2.1A) is threaded onto the leading end of a Geoprobe® probe rod and advanced into the subsurface with a Geoprobe® direct push machine. Additional probe rods are added incrementally and advanced until the desired sampling interval is reached. While the sampler is advanced to depth, O-ring seals at each rod joint, the drive head, and the expendable drive point provide a watertight system. This system eliminates the threat of formation fluids entering the screen before deployment and assures sample integrity.

Once at the desired sampling interval, extension rods are sent downhole until the leading rod contacts the bottom of the sampler screen. The tool string is then retracted approximately 44 inches (1118 mm) while the screen is held in place with the extension rods (Fig. 2.1B). As the tool string is retracted, the expendable point is released from the sampler sheath. The tool string and sheath may be retracted the full length of the screen or as little as a few inches if a small sampling interval is desired.

There are three types of screens that can be used in the Screen Point 16 Groundwater Sampler. Two of the these, a stainless steel screen with a standard slot size of 0.004 inches (0.10 mm) and a PVC screen with a standard slot size of 0.010 inches (0.25 mm), are recovered with the tool string after sampling. The third screen is also manufactured from PVC with a standard slot size of 0.010 inches (0.25 mm), but is designed to be left downhole when sampling is complete. This disposable screen has an exposed screen length of approximately 43 inches (1092 mm). The two screens that are recovered with the sampler both have an exposed screen length of approximately 41 inches (1041 mm).

(continued on following page)

An O-ring on the head of the stainless steel screens maintains a seal at the top of the screen. As a result, any liquid entering the sampler during screen deployment must first pass through the screen. PVC screens do not require an O-ring because the tolerance between the screen head and sampler sheath is near that of the screen slot size.

The screens are constructed such that flexible tubing, a mini-bailer, or a small-diameter bladder pump can be inserted into the screen cavity. This makes direct sampling possible from anywhere within the saturated zone. A removable plug in the lower end of the screens allows the user to grout as the sampler is extracted for further use.

Groundwater samples can be obtained in a number of ways. A common method utilizes polyethylene (TB25L) or Teflon® (TB25T) tubing and a Check Valve Assembly (GW4210). The check valve (with check ball) is attached to one end of the tubing and inserted down the casing until it is immersed in groundwater. Water is pumped through the tubing and to the ground surface by oscillating the tubing up and down.

An alternative means of collecting groundwater samples is to attach a peristaltic or vacuum pump to the tubing. This method is limited in that water can be pumped to the surface from a maximum depth of approximately 26 feet (8 m). Another technique for groundwater sampling is to use a stainless steel Mini-Bailer Assembly (GW41). The mini-bailer is lowered down the inside of the casing below the water level where it fills with water and is then retrieved from the casing.

The latest option for collecting groundwater from the SP16 sampler is to utilize a Geoprobe® MB470 Series Mechanical Bladder Pump (MBP)*. The MBP may be used to meet requirements of the low-flow sampling protocol (Puls and Barcelona 1996, ASTM 2003). Through participation in a U.S. EPA Environmental Technology Verification study, it was confirmed that the MB470 can provide representative samples (EPA 2003).

**The Mechanical Bladder Pump is manufactured under U.S. Patent No. 6,877,965 issued April 12, 2005.*

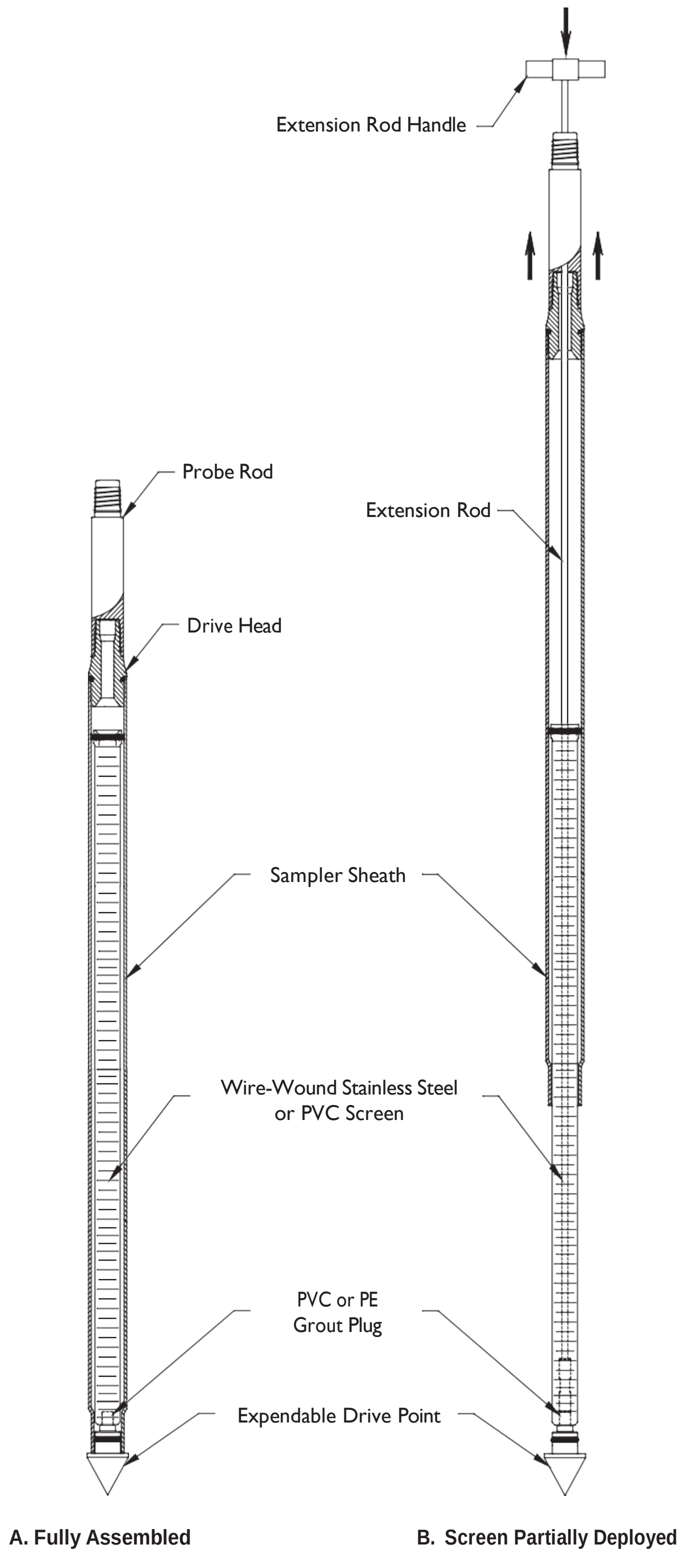


FIGURE 2.1
Screen Point 16 Groundwater Sampler

3.0 TOOLS AND EQUIPMENT

The following tools and equipment can be used to successfully recover representative groundwater samples with the Geoprobe® Screen Point 16 Groundwater Sampler. Refer to Figures 3.1 and 3.2 for identification of the specified parts. Tools are listed below for the most common SP16 / 1.5-inch probe rod configurations. Additional parts for optional rod sizes and accessories are listed in Appendix A.

SP16 Sampler Parts	Part Number
SP16 Sampler Sheath	15187
SP16 Drive Head, 0.5-inch bore, 1.5-inch rods*	18307
SP16 O-ring Service Kit, 1.5-inch rods *(includes 4 each of the O-ring packets below)*	15844
O-rings for Top of SP16 Drive Head, 1.5-inch rods only (Pkt. of 25)	*15389*
O-rings for Bottom of SP16 Drive Head (Pkt. of 25)	*13196*
O-rings for GW1520 Screen Head (Pkt. of 25)	*GW1520R*
O-rings for SP16 Expendable Drive Point (Pkt. of 25)	*GW1555R*
Screen, Wire-Wound Stainless Steel, 4-Slot*	GW1520
Grout Plugs, PE (Pkg. of 25)	GW1552K
Expendable Drive Points, steel, 1.625-inch OD (Pkg. of 25)*	GW1555K
Screen Point 16 Groundwater Sampler Kit, 1.5-inch Probe Rods *(includes 1 each of: 15187, 18307, 15844, GW1520, GW1535, GW1540, GW1555K, and GW1552K)*	15770

Probe Rods and Probe Rod Accessories	Part Number
Drive Cap, 1.5-inch probe rods, threadless, (for GH60 Hammer)	12787
Pull Cap, 1.5-inch probe rods	15090
Probe Rod, 1.5-inch x 60-inch*	11121

Extension Rods and Extension Rod Accessories	Part Number
Screen Push Adapter	GW1535
Grout Plug Push Adapter	GW1540
Extension Rod, 60-inch*	10073
Extension Rod Coupler	AT68
Extension Rod Handle	AT69
Extension Rod Jig	AT690
Extension Rod Quick Link Coupler, pin	AT695
Extension Rod Quick Link Coupler, box	AT696

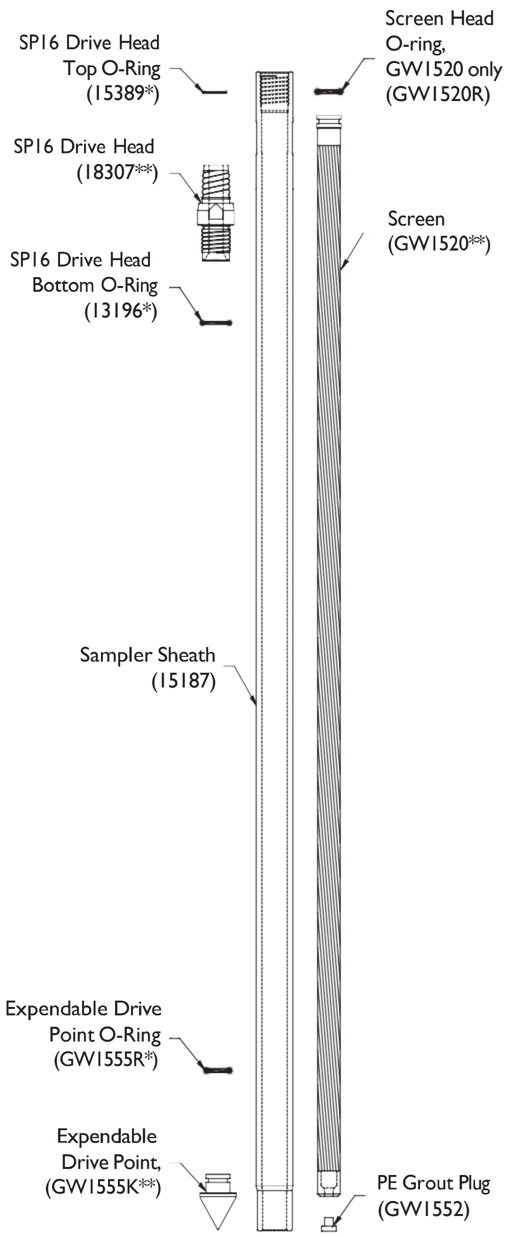
Grout Accessories	Part Number
Grout Nozzle, for 0.375-inch OD tubing	GW1545
High-Pressure Nylon Tubing, 0.375-inch OD / 0.25-inch ID, 100-ft. (30 m)	11633
Grout Machine, self-contained*	GS1000
Grout System Accessories Package, 1.5-inch rods	GS1015

Groundwater Purging and Sampling Accessories	Part Number
Polyethylene Tubing, 0.375-inch OD, 500 ft.*	TB25L
Check Valve Assembly, 0.375-inch OD Tubing*	GW4210
Water Level Meter, 0.438-inch OD Probe, 100 ft. cable*	GW2000
Mechanical Bladder Pump**	MB470
Mini Bailer Assembly, stainless steel	GW41

Additional Tools	Part Number
Adjustable Wrench, 6.0-inch	FA200
Adjustable Wrench, 10.0-inch	FA201
Pipe Wrenches	NA

* See Appendix A for additional tooling options.

** Refer to the Standard Operating Procedure (SOP) for the Mechanical Bladder Pump (Technical Bulletin No. MK3013) for additional tooling needs.



* Included in the SP16 O-ring Service Kit (15844)
** Part numbers show most common tool configuration. See Appendix A for alternative parts.

FIGURE 3.1
SP16 Sampler Parts

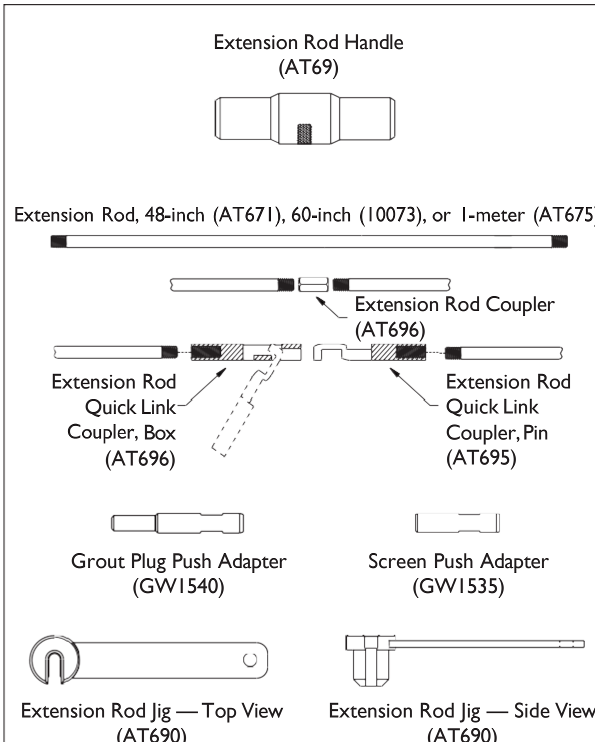


FIGURE 3.2
Geoprobe® Extension Rods and Accessories

4.0 OPERATION

4.1 Basic Operation

The SP16 sampler utilize a stainless steel or PVC screen which is encased in an alloy steel sampler sheath. An expendable drive point is placed in the lower end of the sheath while a drive head is attached to the top. O-rings on the drive head and expendable point provide a watertight sheath which keeps contaminants out of the system as the sampler is driven to depth.

Once the sampling interval is reached, extension rods equipped with a screen push adapter are inserted down the ID of the probe rods. The tool string is then retracted up to 44 inches (1118 mm) while the screen is held in place with the extension rods. The system is now ready for groundwater sampling. When sampling is complete, a removable plug in the bottom of the screen allows for grouting below the sampler as the tool string is retrieved.

4.2 Sampler Options

The Screen Point 15 and Screen Point 16 Groundwater Samplers are nearly identical. Subtle differences in the design of the SP16 sampler make it more durable than the earlier SP15 system. Operators of GH60-equipped machines should always utilize SP16 tooling. Operators of machines equipped with GH40 Series hammers may also choose SP16 tooling when sampling in difficult probing conditions.

A 1.75-inch OD Expendable Drive Point (17066K) and Disposable PVC Screen (16089) provide two useful options for the SP16 sampler. The 1.75-inch drive point may be used when soil conditions make it difficult to remove the sampler after driving to depth. The disposable PVC screen may be left downhole after sampling (when regulations permit) to eliminate the time required for screen decontamination.

4.3 Decontamination

In order to collect representative groundwater samples, all sampler parts must be thoroughly cleaned before and after each use. Scrub all metal parts using a stiff brush and a nonphosphate soap solution. Steam cleaning may be substituted for hand-washing if available. Rinse with distilled water and allow to air-dry before assembly.

4.4 SP16 Sampler Assembly (Figure 4.1)

Part numbers are listed for a standard SP16 sampler using 1.5-inch probe rods. Refer to Page 6 for screen and drive head alternatives.

1. Place an O-ring on a steel expendable drive point (GW1555K). Firmly seat the expendable point in the necked end of a sampler sheath (15187).

2. Install a PE Grout Plug (GW1552) in the bottom end of a Wire-wound Stainless Steel Screen (GW1520). Place a GW1520R O-ring in the groove on the top end of the screen.

3. Slide the screen inside of the sampler sheath with the grout plug toward the bottom of the sampler. Ensure that the expendable point was not displaced by the screen.

4. Install a bottom O-ring (13196) on a Drive Head (18307 or 15188). Thread the drive head into the sampler sheath using an adjustable wrench if necessary to ensure complete engagement of the threads. Attach a Drive Cap (12787 or 15590) to the top of the drive head.

   NOTE: The 18307 drive head should be used whenever possible as the smaller 0.5-inch ID provides a greater material cross-section for increased durability.

Sampler assembly is complete.

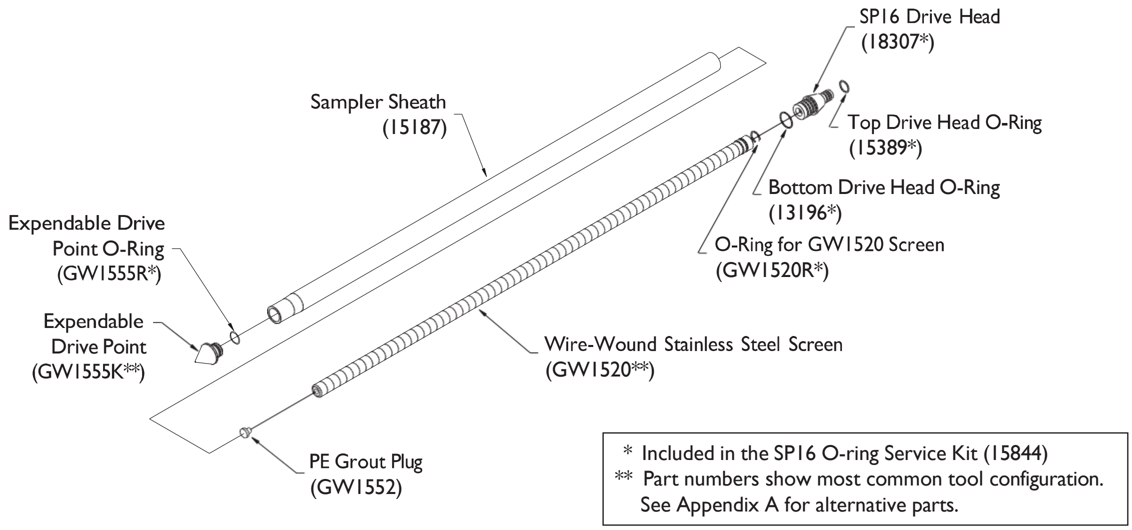


FIGURE 4.1
Screen Point 16 Groundwater Sampler Assembly

4.5 Advancing the SP16 Sampler

To provide adequate room for screen deployment with the Rod Grip Pull System, the probe derrick should be extended a little over halfway out of the carrier vehicle when positioning for operation.

1. Begin by placing the assembled sampler (Fig. 2.1.A) in the driving position beneath the hydraulic hammer of the direct push machine as shown in Figure 4.2.

2. Advance the sampler with the throttle control at slow speed for the first few feet to ensure that the sampler is aligned properly. Switch to fast speed for the remainder of the probe stroke.

3. Completely raise the hammer assembly. Remove the drive cap and place an O-ring in the top groove of the drive head. Distilled water may be used to lubricate the O-ring if needed.

Add a probe rod (length to be determined by operator) and reattach the drive cap to the rod string. Drive the sampler the entire length of the new rod with the throttle control at fast speed.

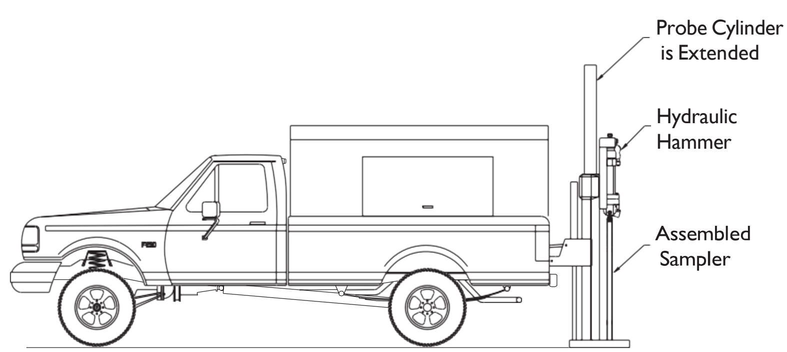


FIGURE 4.2
Screen Point 16 Groundwater Sampler in Driving Position

4. Repeat Step 3 until the desired sampling interval is reached. Approximately 12 inches (305 mm) of the last probe rod must extend above the ground surface to allow attachment of the puller assembly. A 12-inch (305 mm) rod may be added if the tool string is over-driven.

5. Remove the drive cap and retract the probe derrick away from the tool string.

4.6 Screen Deployment

1. Thread a screen push adapter (GW1535) on an extension rod of suitable length (AT671, 10073, or AT675). Attach a threaded coupler (AT68) to the other end of the extension rod. Lower the extension rod inside of the probe rod taking care not to drop it down the tool string. An extension rod jig (AT690) may be used to hold the rods.

2. Add extension rods until the adapter contacts the bottom of the screen. To speed up this step,it is recommended that Extension Rod Quick Links (AT695 and AT696) are used at every other rod joint.

3. Ensure that at least 48 inches (1219 mm) of extension rod protrudes from the probe rod. Thread an extension rod handle (AT69) on the top extension rod.

4. Maneuver the probe assembly into position for pulling.

5. Raise (pull) the tool string while physically holding the screen in place with the extension rods (Fig. 4.3.B). A slight knock with the extension rod string will help to dislodge the expendable point and start the screen moving inside the sheath.

   Raise the hammer and tool string about 44 inches (1118 cm) if using a GW1520 or GW1530 screen. At this point the screen head will contact the necked portion of the sampler sheath (Fig. 4.3.C.) and the extension rods will rise with the probe rods. Use care when deploying a PVC screen so as not to break the screen when it contacts the bottom of the sampler sheath.

   The Disposable Screen (16089) will extend completely out of the sheath if the tool string is raised more than 45 inches (1143 mm). Measure and mark this distance on the top extension rod to avoid losing the screen during deployment.

6. Remove the rod grip handle, lower the hammer assembly, and retract the probe derrick. Remove the top extension rod (with handle) and top probe rod. Finally, extract all extension rods.

7. Groundwater samples can now be collected with a mini-bailer, peristaltic or vacuum pump, tubing bottom check valve assembly, bladder pump, or other acceptable small diameter sampling device.

   When inserting tubing or a bladder pump down the rod string, ensure that it enters the screen interval. The leading end of the tubing or bladder pump will sometimes catch at the screen head giving the illusion that the bottom of the screen has been reached. An up-and-down motion combined with rotation helps move the tubing or bladder pump past the lip and into the screen.

4.7 Abandonment Grouting for GW1520 and GW1530 Screens

The SP16 Sampler can meet ASTM D 5299 requirements for abandoning environmental wells or borings when grouting is conducted properly. A removable grout plug makes it possible to deploy tubing through the bottom of GW1520 and GW1530 screens. A GS500 or GS1000 Grout Machine is then used to pump grout into the open probe hole as the sampler is withdrawn. The following procedure is presented as an example only and should be modified to satisfy local abandonment grouting regulations.

1. Maneuver the probe assembly into position for pulling. Attach the rod grip puller to the top probe rod. Raise the tool string approximately 4 to 6 inches (102 to 152 cm) to allow removal of the grout plug.

2. Thread the Grout Plug Push Adapter (GW1540) onto an extension rod. Insert the adapter and extension rod inside the probe rod string. Add extension rods until the adapter contacts the grout plug at the bottom of the screen. Attach the handle to the top extension rod. When the extension rods are slightly raised and lowered, a relatively soft rebound should be felt as the adapter contacts the grout plug. This is especially true when using a PVC screen.

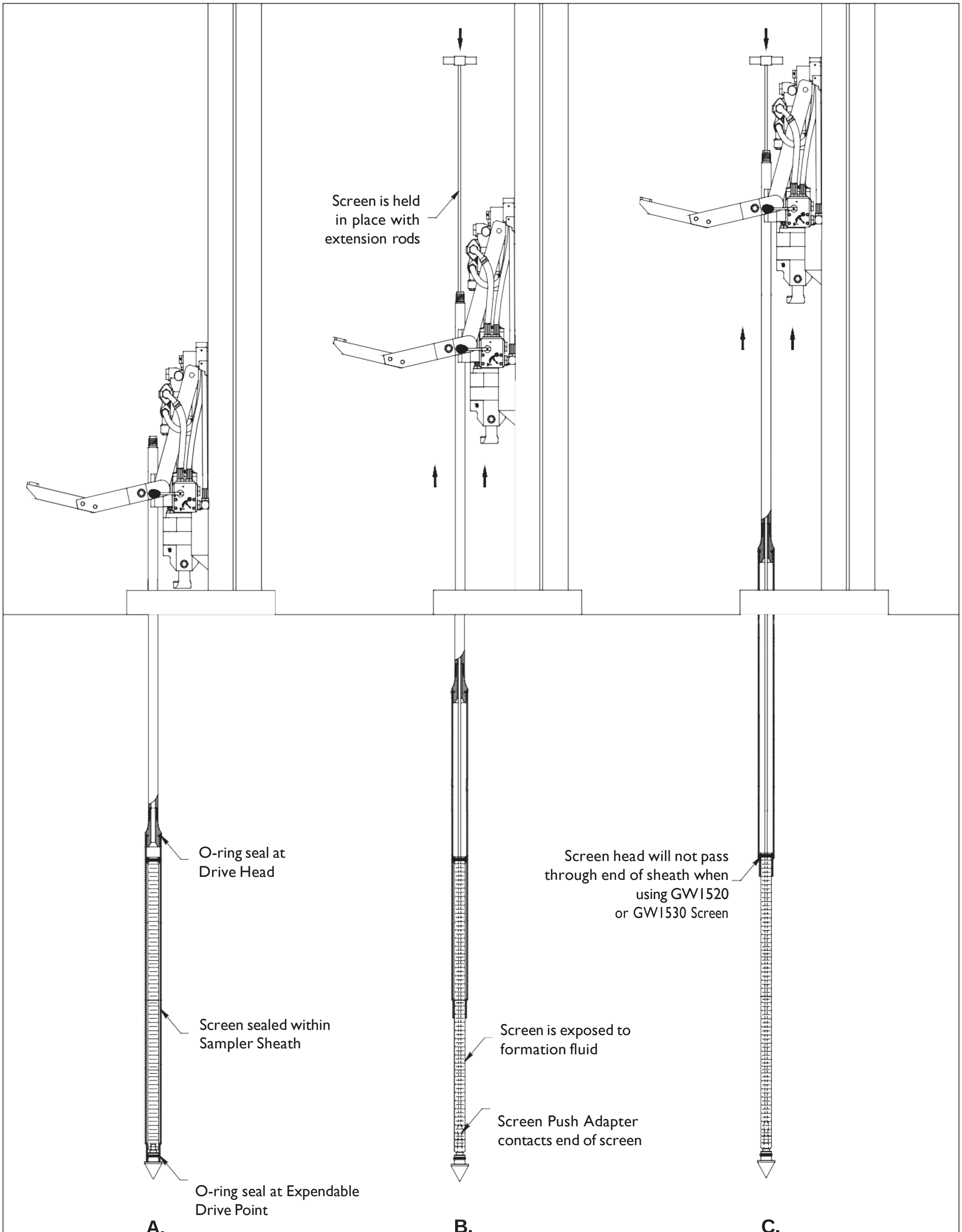


FIGURE 4.3
Screen Deployment for SP16 Sampler

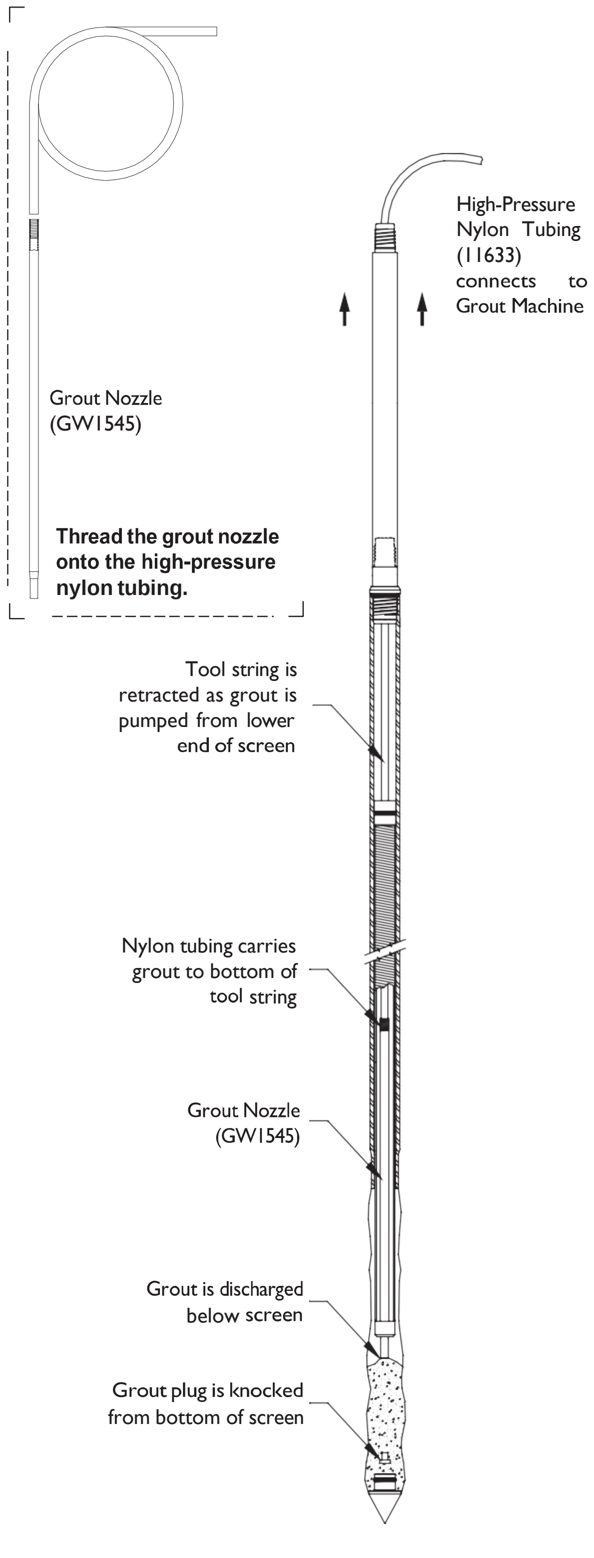


FIGURE 4.4
Grouting the SP16 Sampler With a GW1520 or GW1530 Screen

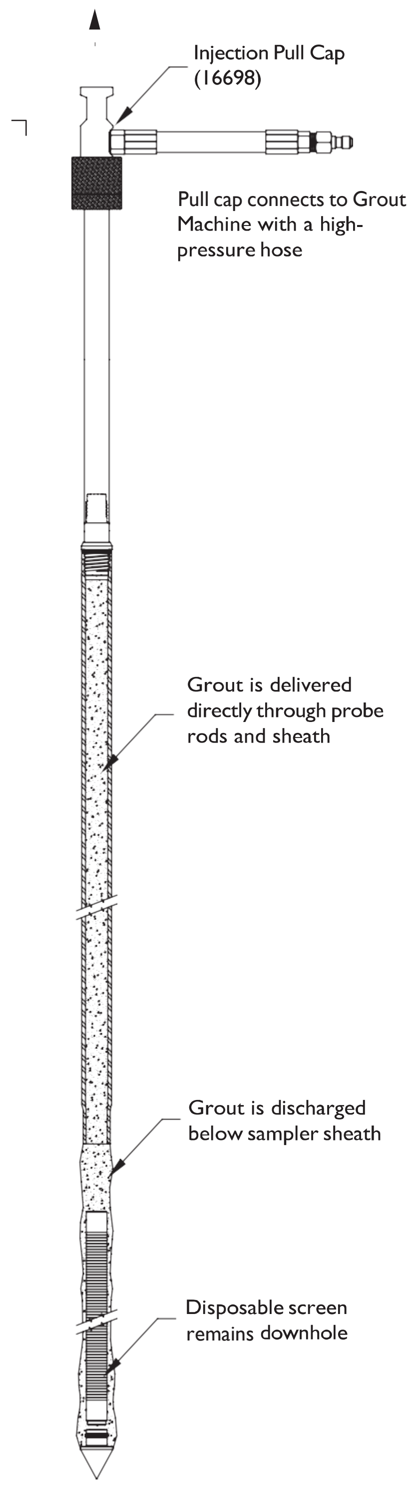


FIGURE 4.5
Grouting the SP16 Sampler With a 16089 Disposable Screen

3. Place a mark on the extension rod even with the top of the probe rod. Apply downward pressure on the extension rods and push the grout plug out of the screen. The mark placed on the extension rod should now be below the top of the probe rod. Remove all extension rods.

   Note: When working with a stainless steel screen, it may be necessary to raise and quickly lower the extension rods to jar the grout plug free. When the plug is successfully removed, a metal-on-metal sensation may be noted as the extension rods are gently "bounced" within the probe rods.

4. A Grout Nozzle (GW1545) is now connected to High-Pressure Nylon Tubing (11633) and inserted down through the probe rods to the bottom of the screen (Fig. 4.4). It may be necessary to pump a small amount of clean water through the tubing during deployment to jet out sediments that settled in the bottom of the screen. Resistance will sometimes be felt as the grout nozzle passes through the drive head. Rotate the tubing while moving it up-and-down to ensure that the nozzle has reached the bottom of the screen and is not hung up on the drive head.

   Note: *All probe rods remain strung on the tubing as the tool string is pulled. Provide extra tubing length to allow sufficient room to lay the rods on the ground as they are removed. An additional 20 feet is generally enough.*

5. Operate the grout pump while pulling the first rod with the rod grip pull system. Coordinate pumping and pulling rates so that grout fills the void left by the sampler. After pulling the first rod, release the rod grip handle, fully lower the hammer, and regrip the tool string. Unthread the top probe and slide it over the tubing placing it on the ground near the end of the tubing.

6. Repeat Step 5 until the sampler is retrieved. Do not bend or kink the tubing when pulling and laying out the probe rods. Sharp bends create weak spots in the tubing which may burst when pumping grout. Remember to operate the grout pump only when pulling the rod string. The probe hole is thus filled with grout from the bottom up as the rods are extracted.

7. Promptly clean all probe rods and sampler parts before the grout sets up and clogs the equipment.

4.8 Abandonment Grouting for the 16089 Disposable Screen

ASTM D 5299 requirements can also be met for the SP16 samplers when using the 16089 disposable screen. Because the screen remains downhole after sampling, the operator may choose either to deliver grout to the bottom of the tool string with nylon tubing or pump grout directly through the probe rods using an Injection Pull Cap (16698). A GS500 or GS1000 Grout Machine is needed to pump grout into the open probe hole as the sampler is withdrawn. The following procedure is presented as an example only and should be modified to satisfy local abandonment grouting regulations.

1. Maneuver the probe assembly into position for pulling with the rod grip puller.

2. Thread the screen push adapter onto an extension rod. Insert the adapter and extension rod inside the probe rod string. Add extension rods until the adapter contacts the bottom of the screen. Attach the handle to the top extension rod.

3. The disposable screen must be extended at least 46 inches (1168 mm) to clear the bottom of the sampler sheath. Considering the length of screen deployed in Section 4.7, determine the remaining distance required to fully extend the screen from the sheath. Mark this distance on the top extension rod.

4. Pull the tool string up to the mark on the top extension rod while holding the disposable screen in place.

   The screen is now fully deployed and the sampler is ready for abandonment grouting. Apply grout to the bottom of the tool string during retrieval using either flexible tubing (as described in Section 4.7) or an injection pull cap (Fig. 4.5). This section continues with a description of grouting with a pull cap.

5. Remove the rod grip handle and maneuver the probe assembly directly over the tool string. Thread an Injection Pull Cap (16698) onto the top probe rod and close the hammer pull latch over the top of the pull cap.

6. Connect the pull cap to a Geoprobe® grout machine using a high-pressure grout hose.

7. Operate the pump to fill the entire tool string with grout. When a sufficient volume has been pumped to fill the tool string, begin pulling the rods and sampler while continuing to operate the grout pump. Considering the known pump volume and sampler cross-section, time tooling withdrawal to slightly "overpump" grout into the subsurface. This will ensure that all voids are filled during sampler retrieval.

   The grouting process can lubricate the probe hole sufficiently to cause the tool string to slide back downhole when disconnected from the pull cap. Prevent this by withdrawing the tool string with the rod grip puller while maintaining a connection to the grout machine with the pull cap.

4.9 Retrieving the Screen Point 16 Sampler

If grouting is not required, the Screen Point 16 Sampler can be retrieved by pulling the probe rods as with most other Geoprobe® applications. The Rod Grip Pull System should be used for this process as it allows the operator to remove rods without completely releasing the tool string. This avoids having the probe rods fall back downhole when released during the pulling procedure. A standard Pull Cap (15164) may still be used if preferred. Refer to the Owner's Manual for your Geoprobe® direct push machine for specific instructions on pulling the tool string.

5.0 REFERENCES

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Appendix A
ALTERNATIVE PARTS

The following parts are available to meet unique soil conditions. See section 3.0 for a complete listing of the common tool configurations for the Geoprobe® Screen Point 16 Groundwater Sampler.

SP16 Sampler Parts and Accessories	Part Number
SP16 Drive Head, 0.625-inch bore, 1.5-inch rods	15188
Expendable Drive Points, aluminum, 1.625-inch OD (Pkg. of 25)	GW1555ALK
Expendable Drive Points, steel, 1.75-inch OD (Pkg. of 25)	17066K
Screen, PVC, 10-Slot	GW1530
Screen, Disposable, PVC, 10-Slot	16089

Groundwater Purging and Sampling Accessories	Part Number
Polyethylene Tubing, 0.25-inch OD, 500 ft.	TB17L
Polyethylene Tubing, 0.5-inch OD, 500 ft.	TB37L
Polyethylene Tubing, 0.625-inch OD, 50 ft.	TB50L
Check Valve Assembly, 0.25-inch OD Tubing	GW4240
Check Valve Assembly, 0.5-inch OD Tubing	GW4220
Check Valve Assembly, 0.625-inch OD Tubing	GW4230
Water Level Meter, 0.375-inch OD Probe, 100-ft. cable	GW2001
Water Level Meter, 0.438-inch OD Probe, 200-ft. cable	GW2002
Water Level Meter, 0.375-inch OD Probe, 200-ft. cable	GW2003
Water Level Meter, 0.438-inch OD Probe, 30-m cable	GW2005
Water Level Meter, 0.438-inch OD Probe, 60-m cable	GW2007
Water Level Meter, 0.375-inch OD Probe, 60-m cable	GE2008

Grouting Accessories	Part Number
Grout Machine, auxiliary-powered	GS500

Probe Rods, Extension Rods, and Accessories	Part Number
Probe Rod, 1.5-inch x 1-meter	17899
Probe Rod, 1.5-inch x 48-inch	13359
Drive Cap, 1.5-inch rods (for GH40 Series Hammer)	15590
Rod Grip Pull Handle, 1.5-inch Probe Rods (for GH40 Series Hammer)	GH1555
Extension Rod, 48-inch	AT671
Extension Rod, 1-meter	AT675

Equipment and tool specifications, including weights, dimensions, materials, and operating specifications included in this brochure are subject to change without notice. Where specifications are critical to your application, please consult Geoprobe Systems®.

Geoprobe Systems®

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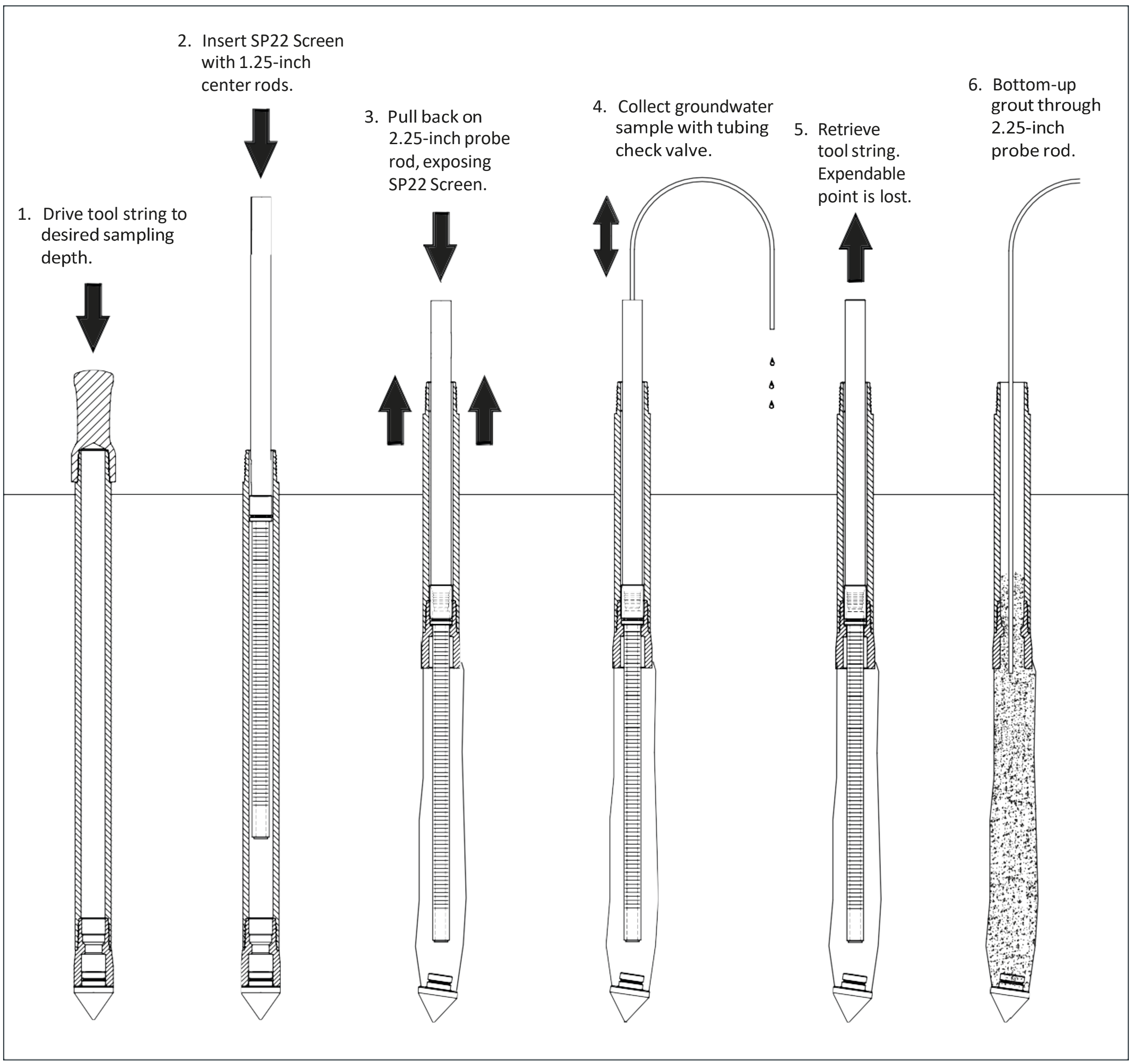
Geoprobe® Screen Point 22 Groundwater Sampler

Standard Operating Procedure

Technical Bulletin No. MK3173

PREPARED: April 2010



OPERATION OF THE GEOPROBE® SCREEN POINT 22 GROUNDWATER SAMPLER

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Registered Trademarks of Kejr, Inc., Salina, Kansas

Screen Point 22 Groundwater Sampler is manufactured
under U.S. Patent 5,612,498

1.0 OBJECTIVE

The objective of this procedure is to deploy a stainless steel or PVC screen at depth, obtain a representative water sample from the screen interval, and grout the probe hole during abandonment. The Screen Point 22 Groundwater Sampler enables the operator to conduct abandonment grouting that meets American Society for Testing and Materials (ASTM) Method D 5299 requirements for decommissioning wells and borings for environmental activities (ASTM 1993).

2.0 BACKGROUND

2.1 De!nitions

Geoprobe®: A brand name of high quality, hydraulically powered machines that utilize static force and percussion or rotation to advance sampling and logging tools into the subsurface. The Geoprobe® brand name refers to both machines and tools manufactured by Geoprobe Systems®, Salina, Kansas. Geoprobe® tools are used to perform activities such as soil core and soil gas sampling, groundwater sampling and monitoring, soil conductivity and contaminant logging, grouting, and materials injection.

Screen Point 22 (SP22) Groundwater Sampler: A direct push device consisting of a PVC or stainless steel screen that is lowered (post-run) to depth within a sealed string of steel probe rods and then deployed for the collection of representative groundwater samples. Upon deployment, up to 48 inches (1219 mm) of screen can be exposed to the formation. There is also an optional 12-inch screen that can be used. The Screen Point 22 Groundwater Sampler is designed for use with 2.25-inch probe rods and machines equipped with the more powerful GH60 and GH80 series hydraulic hammers. Operators with GH40 series hammers may choose to use this sampler in soils where driving is easier.

Rod Grip Pull System: An attachment mounted on the hydraulic hammer of a direct push machine which makes it possible to retract the tool string with probe rods or !exible tubing protruding from the top of the probe rods. The Rod Grip Pull System includes a pull block with rod grip jaws that are bolted directly to the machine. A removable handle assembly straddles the tool string while hooking onto the pull block to effectively grip the probe rods as the hammer is raised. A separate handle assembly is required for each probe rod diameter.

2.2 Discussion (Fig. 2.1)

In this procedure, 2.25-inch probe rods are advanced into the subsurface with a Geoprobe® subsurface machine (Fig. 2.1, Step 1). While the tool string is advanced to depth, O-ring seals at each rod joint, the expendable point holder, and the expendable drive point provide a watertight system. This eliminates the threat of formation !uids entering the screen before deployment and assures sample integrity.

Once the leading end of the 2.25-inch probe rods reaches the desired sampling interval, an SP22 screen is lowered to the bottom of the rods using a string of either 1.25-inch outside diameter (OD) light-weight center rods, 1.25-inch probe rods, or 0.75-inch schedule 40 !ush-thread PVC riser (Fig. 2.1, Step 2). The 2.25-inch rods are then retracted while the SP22 screen is held in place with the 1.25-inch rods or PVC riser (Fig 2.1, Step 3). As the 2.25-inch tool string is retracted, the expendable point is released from the expendable point holder. The tool string and expendable point holder may be retracted the full length of the screen or as little as a few inches if a small sampling interval is desired.

The SP22 Sampler can also be used with the Geoprobe® DT22 system. (Fig. 2.2)

(continued on following page)

Expendable Drive Points

The SP22 system utilizes an SP22 Expendable Point Holder (33764) and standard 2.45-inch (62-mm) OD steel Expendable Drive Points for 2.25-inch probe rods (AT2015K). Extended Shank Expendable Drive Points (19442) are available for soft soil conditions where standard points may be advanced out of the point holder during percussion. A third option is to use a part number 43128 SP22 Expendable Point Holder along with 1.625-inch (41-mm) steel Expendable Drive Points (GW1555K). These smaller drive points are more economical to purchase and ship, but must not be used with GH80 Series Hydraulic Hammers as they may not stay seated during percussion.

Screens

Two types of screens have been developed for use in the Screen Point 22 Groundwater Sampler - a stainless steel screen with a standard slot size of 0.004 inches (0.10 mm) and a PVC screen with a standard slot size of 0.010 inches (0.25 mm). These screens are available in nominal 48- and 12-inch lengths. Effective screen lengths for the 48- and 12-inch PVC screens are 48 inches (1219 mm) and 12 inches (305 mm), while 48- and 12-inch stainless steel screens have effective screen lengths of 43 inches (1092 mm) and 14 inches (356 mm) respectively. Both types of screens are recovered with the tool string after sampling.

The SP22 PVC Screen Head Adapter (37871) provides yet another screen option for the SP22 sampler. Using this adapter, a section of slotted 0.75-inch Schedule 40 PVC pipe may be lowered through the 2.25-inch probe rods using a string of !ush-threaded 0.75-inch Schedule 40 PVC Riser. An SP22 PVC Screen Plug (38968) is installed in the leading end of the slotted pipe prior to use. The slotted pipe may be cut and the screen plug installed to provide custom screen lengths .

An O-ring is located at the top of each stainless screen and on the screen adapters. When a screen is deployed, this O-ring maintains a seal between the top of the screen and the inner wall of the probe rods or expendable point holder as indicated in Figure 2.1. As a result, any liquid entering the tool string must !rst pass through the screen.

Screens are constructed such that equipment can be inserted into the screen cavity for sample collection as noted in the following section and illustrated in Figure 2.1, Step 4. This makes direct sampling possible from anywhere within the saturated zone.

The inner rod string and screen are generally removed prior to grouting through the 2.25-inch rod string as shown in Figure 2.1, Steps 5-6. However, a removable plug in the lower end of the screens allows for grouting through !exible tubing extending out the bottom of the screen as with the Geoprobe® SP15/16 Groundwater Samplers if desired.

Sample Collection

Groundwater samples can be obtained from the SP22 screen in a number of ways. A common method utilizes 0.375-inch OD polyethylene (TB25L) or Te!on® (TB25T) tubing and a check valve assembly. The check valve (with check ball) is attached to one end of the tubing and inserted down the casing until it is immersed in groundwater. Water is then pumped through the tubing and to the ground surface by oscillating the tubing up and down.

An SP22 Check Valve Assembly (37893) is recommended if sampling through 1.25-inch light-weight center rods. The SP22 Check Valve Assembly is approximately 20 inches long to enable it to pass through the stepped diameters at each rod joint that may cause problems for other, shorter check valves.

An alternative means of collecting groundwater samples is to attach a peristaltic or vacuum pump to tubing that is inserted through the inner rods to within the SP22 screen. This method is limited in that water can be pumped to the surface from a maximum depth of approximately 26 feet (8 m). Another technique for groundwater sampling is to use a stainless steel Mini-Bailer Assembly (GW41). The mini-bailer is lowered down the inside of the casing below the water level where it !lls with water and is then retrieved from the casing.

The latest option for collecting groundwater from the SP22 Sampler is to utilize a Geoprobe® MB470 Series Mechanical Bladder Pump (MBP)*. The MBP may be used to meet requirements of the low-!ow sampling protocol (Puls and Barcelona 1996, ASTM 2003). Through participation in a U.S. EPA Environmental Technology Veri!cation study, it was con!rmed that the MB470 can provide representative samples (EPA 2003).

**The Mechanical Bladder Pump is manufactured under U.S. Patent No. 6,877,965 issued April 12, 2005.*

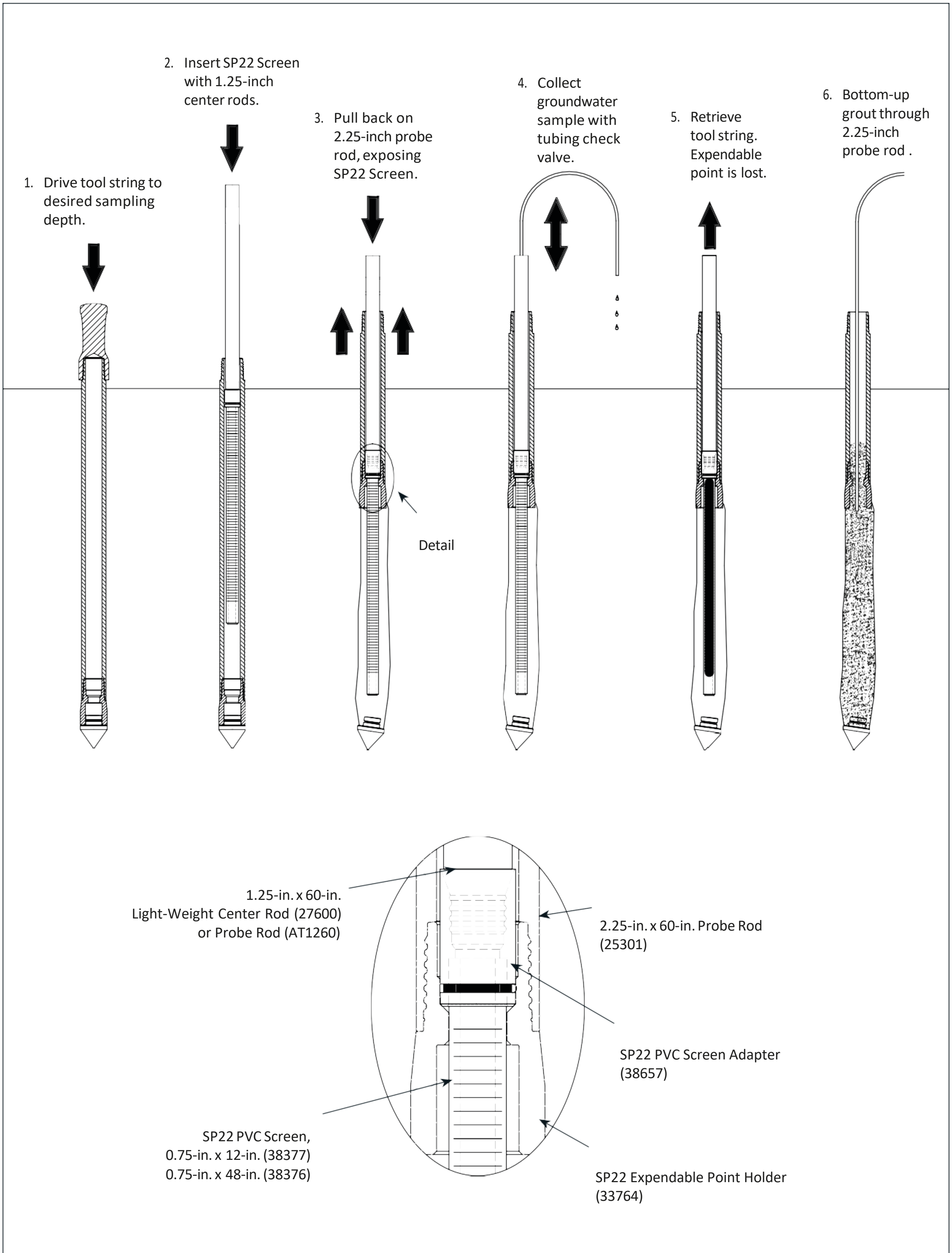

FIGURE 2.1
Screen Point 22 Groundwater Sampler - 0.75-inch PVC Screen Option

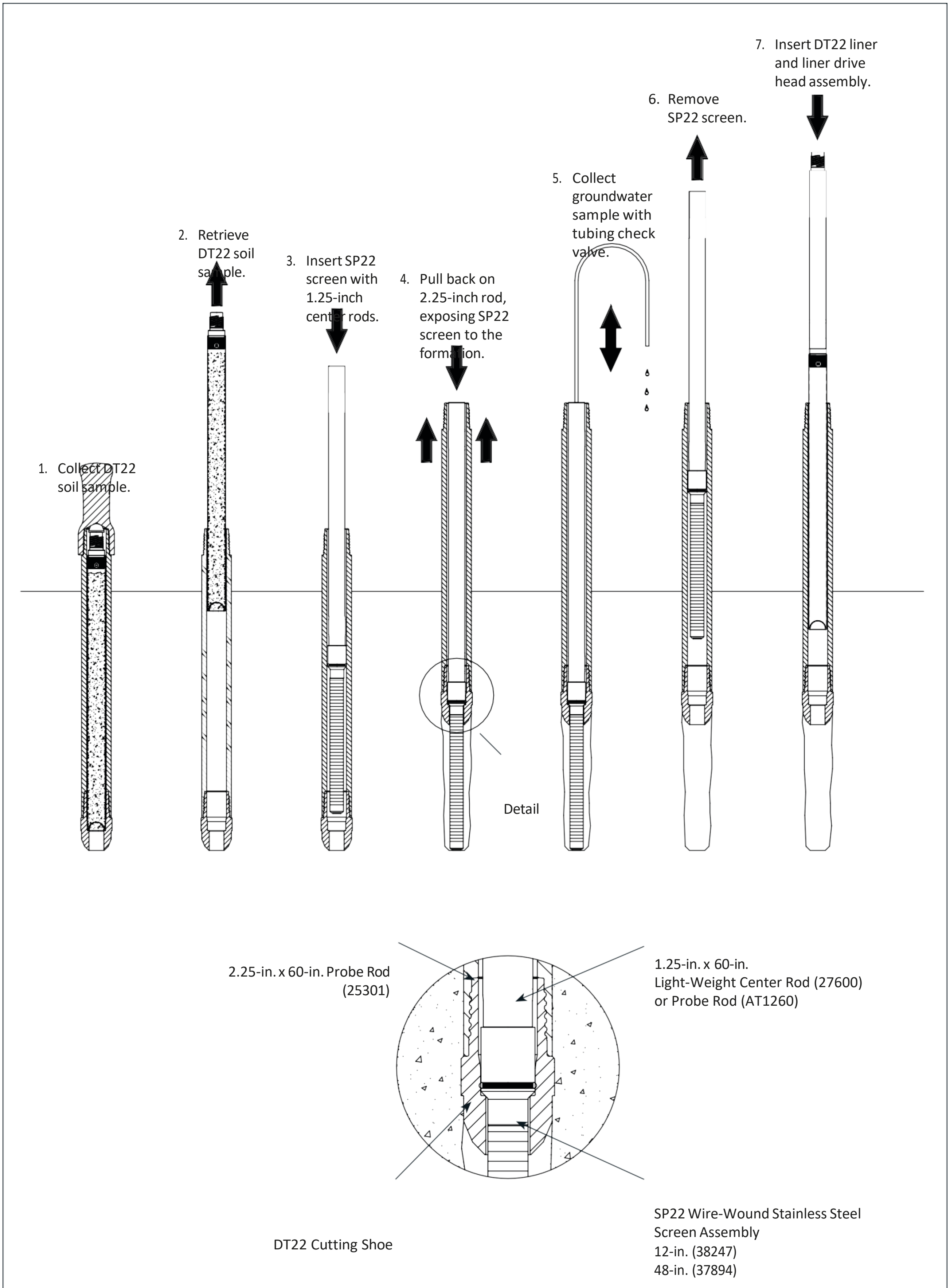

FIGURE 2.2

Screen Point 22 Groundwater Sampler Operation with DT22 Sampling System

3.0 TOOLS AND EQUIPMENT

The following tools and equipment can be used to successfully recover representative groundwater samples with the Geoprobe® Screen Point 22 Groundwater Sampler. Refer to Figures 3.1 and 3.2 for identi!cation of the speci!ed parts. Tools are listed below for the most common SP22 / 2.25-inch probe rod con!gurations. Additional rod sizes and accessories are available. Contact Geoprobe Systems® for information regarding tools and equipment options.

SP22 Sampler Parts	Part Number
SP22 Screen, Wire-Wound Stainless Steel, 4-Slot (48-in.)	37894
SP22 Screen, Wire-Wound Stainless Steel, 4-Slot (12-in.)	38247
Grout Plugs, PE (Pkg. of 25)	GW1552K
SP22 Screen, PVC, 10-Slot, 0.75-in. x 48-in	38376
SP22 Screen, PVC, 10-Slot, 0.75-in. x 48-inch, Kit (includes 2 each of 38376 and 38429)	*38664*
SP22 Screen, PVC, 10-Slot, 0.75-in. x 12-in.	38377
SP22 Screen, PVC, 10-Slot 0.75-in. x 12-in., Kit (includes 2 each of 38377 and 38429)	*38667*
SP22 PVC Screen Plug	38968
SP22 PVC Screen Plug Kit (includes 10 of 38968).	*38530*
SP22 PVC Screen Adapter, 0.75-in. PVC x 1.25-in. Probe Rod Box.	38657
SP22 PVC Screen Head Adapter, 0.75-in. (for !ush-threaded 0.75-in. Schedule 40 PVC)	37871
SP22 O-ring Kit (Pkg. of 10 O-rings for SP22 PVC screen adapters and stainless steel screens)	37853
O-rings, 0.75-in. PVC Riser (Pkg. of 25)	GW4401R
SP22 Expendable Point Holder, 2.25-in. Probe Rods, AT2045K and 19442 Points	33764
SP22 Expendable Point Holder, 2.25-in. Probe Rods, GW1555 Points*	43128

Outer Casing (2.125-inch Probe Rods) and Inner Rod String	Part Number
Probe Rod, 2.25-in. x 60-in.	25301
Expendable Drive Points, Steel, 2.45-in. OD (Pkg. of 25)	AT2015K
Expendable Drive Points, Steel, 2.45-in. OD, extended shank.	19442
Expendable Points, steel, 1.625-in. OD (Pkg. of 25)*	GW1555K
Drive Cap, 2.25-in. Probe Rods, Threadless, (for GH60 and GH80 Series Hammers)	31530
O-Rings, 2.25-in. Probe Rods (Pkg. of 25)	AT2100R
Rod Grip Handle, 2.25-in. Probe Rods, (for GH60 and GH80 Series Hammers)	29385
Light-Weight Center Rod, 1.25-in. x 60-in.	27600
Probe Rod, 1.25-in. x 60-in.	AT1260
O-ring, 1.25-in. rods (Pkg. of 25)	AT1250R
Rod Grip Handle, 1.25/1.5-in. Rods, (for GH60 and GH80 Series Hammers)	15554
PVC Riser, 0.75-in. Schedule 40 x 60-inch	11747
PVC Pipe, 0.75-in. Schedule 40 x 60-inch, 10-Slot	17474

Grout Accessories	Part Number
High-Pressure Nylon Tubing, 0.375-in. OD / 0.25-in. ID, 100-ft. (30 m)	11633
Grout Machine, Auxiliary-Powered	GS2200
Grout System Accessories Package, 2.25-in. rods	GS1015

Groundwater Purging and Sampling Accessories	Part Number
Polyethylene Tubing, 0.375-in. OD, 500 ft	TB25L
Check Valve Assembly, 0.375-in. OD Tubing x 20 in. Long	37893
Water Level Meter, 0.438-in. OD Probe, 100 ft. cable	GW2000
Mechanical Bladder Pump**	MB470
Mini Bailer Assembly, Stainless Steel	GW41

* Not for use with GH80 Series Hydraulic Hammers

** Refer to the Standard Operating Procedure (SOP) for the Mechanical Bladder Pump (Technical Bulletin No. MK3013) for additional tooling needs.

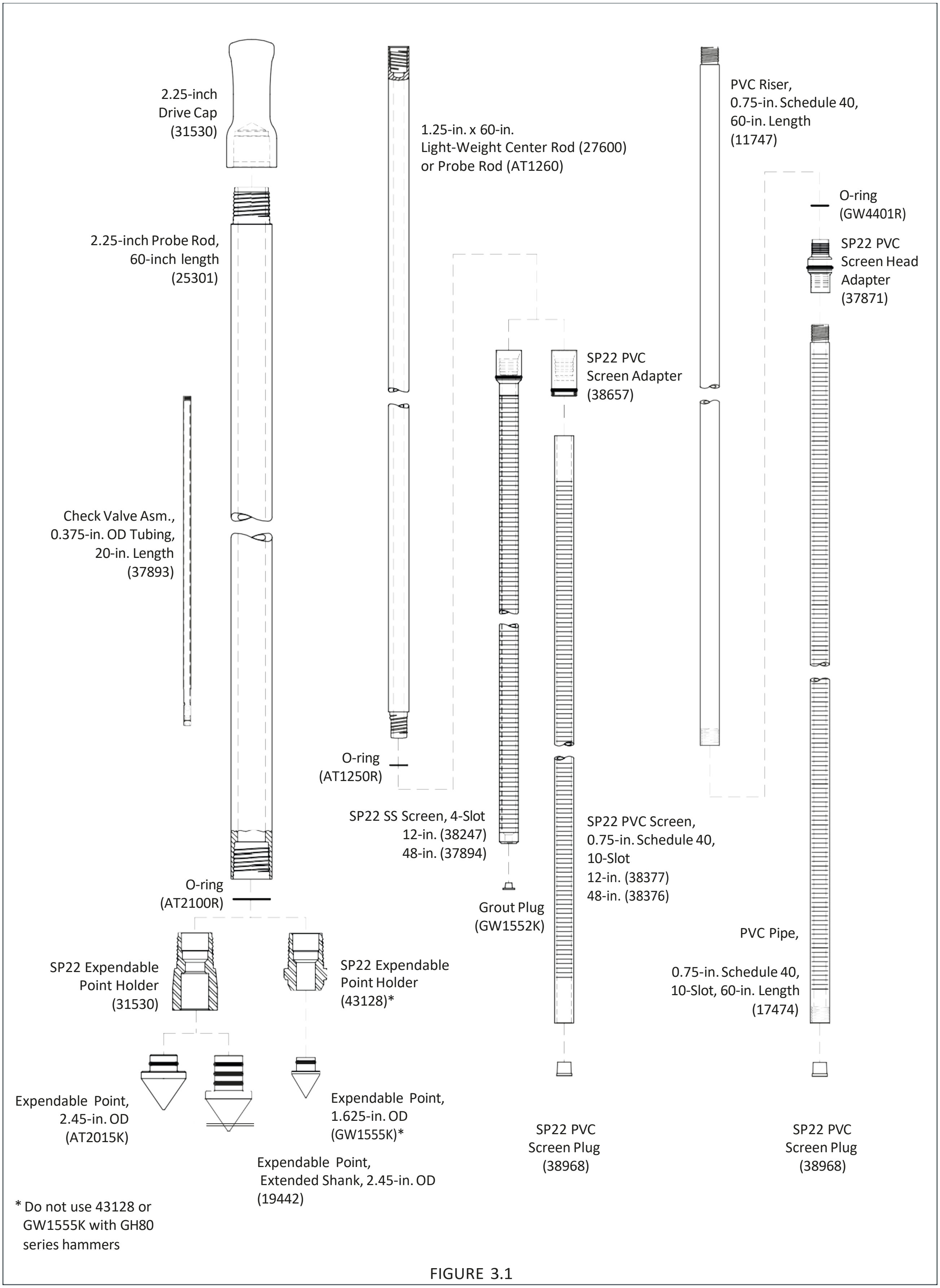

FIGURE 3.1

SP22 Sampler Parts

4.0 OPERATION

4.1 Basic Operation

The SP22 Sampler utilizes a stainless steel or PVC screen which is lowered (post-run) through an alloy steel 2.25-inch OD probe rod tool string. An expendable drive point is placed in an expendable point holder on the leading 2.25-inch probe rod prior to advancement (Fig. 4.1). This expendable point is removed and stays in the subsurface as the rods are pulled back to exposes the SP22 screen. O-rings on the probe rods , the expendable point holder, and the expendable drive point provide a watertight tool string which keeps contaminants out of the system as the 2.25-inch rods are driven to depth in preparation for installation of the SP22 screen.

Once the sampling interval is reached with the 2.25-inch probe rods, the stainless steel or PVC screen is lowered through the rods using 1.25-inch probe rods, 1.25-inch light-weight center rods, or 0.75-inch PVC riser pipe. The 2.25-inch tool string is then retracted while the screen is held in place with the inner rods or riser. The system is now ready for groundwater sampling. When sampling is complete, the inner rods and screen are removed for grouting during retrieval or the 2.25-inch rods. Alternatively, a removable plug is located in the bottom of the screens to allow grouting directly through the inner tool string with high-pressure tubing during retrieval.

4.2 Decontamination

In order to collect representative groundwater samples, all sampler parts must be thoroughly cleaned before and after each use. Scrub all metal parts using a stiff brush and a nonphosphate soap solution. Steam cleaning may be substituted for hand-washing if available. Rinse with distilled water and allow to air-dry before assembly.

4.3 Lead Rod Assembly (Fig. 4.1)

1. Place an O-ring on the expendable point holder.

2. Thread expendable point holder into the 2.25-inch probe rod.

3. Place an O-ring on a steel expendable drive point.

4. Firmly seat the expendable point in the expendable point holder.

5. Place 2.25-inch Drive Cap (31530) on the top of the 2.25-inch probe rod. The lead rod assembly is now ready to be driven to depth.

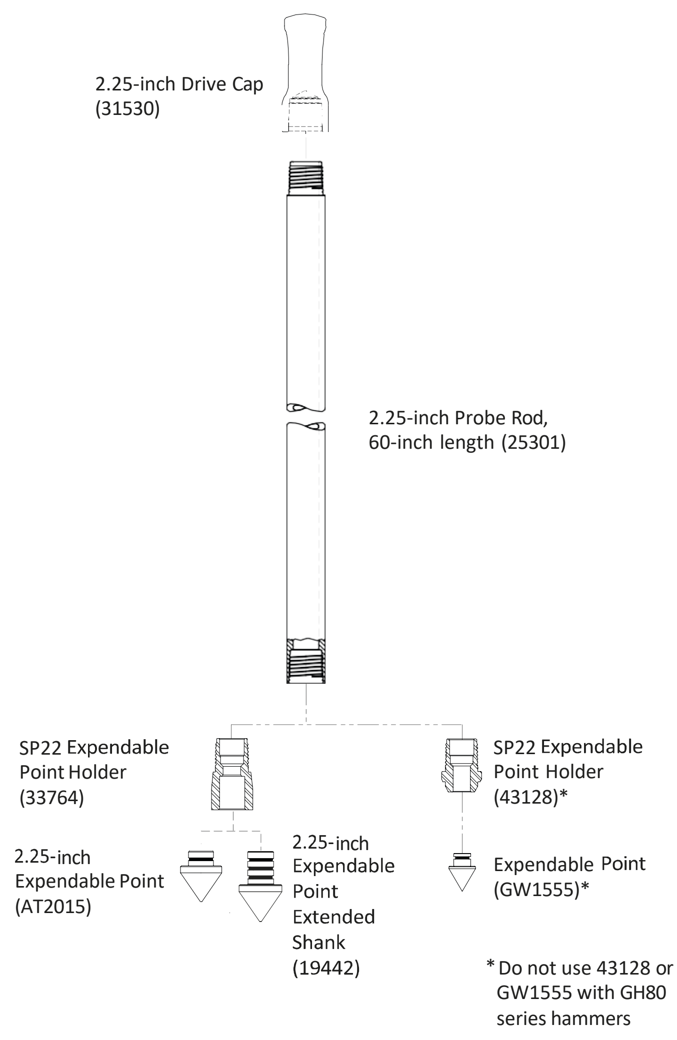

FIGURE 4.1
Lead Rod Assembly for the SP22 Groundwater Sampler

4.4 Advancing the Tool String (Fig. 4.2, step 1)

To provide adequate room for screen deployment with the Rod Grip Pull System, the probe derrick should be extended a little over halfway out of the carrier vehicle when positioning for operation.

1. Drive !rst 2.25-inch probe rod (as assembled in section 4.3).

2. Advance the tool string at a slow speed for the !rst few feet to ensure that the string is aligned properly.

3. Completely raise the hammer assembly. Remove the drive cap and place an O-ring in the top groove of the driven probe rod. Distilled water may be used to lubricate the O-ring if needed.

   Add a probe rod (length to be determined by operator) and reattach the drive cap to the rod string. Drive the tool string the entire length of the new rod.

4. Repeat Step 3 until the desired sampling interval is reached. Approximately 12 inches (305 mm) of the last probe rod must extend above the ground surface to allow attachment of the puller assembly. A 12-inch (305 mm) rod may be added if the tool string is over-driven.

5. Remove the drive cap and retract the probe derrick away from the tool string.

4.5 Screen Deployment (Fig 4.2, step 2 - 4)

1. Attach an SP22 stainless steel or PVC screen to a 1.25-inch probe rod, 1.25-inch light-weight center rod, or 0.75-inch !ush-thread PVC riser using an SP22 PVC Screen Adapter (38657) or SP22 PVC Screen Head Adapter (37871) as shown in Figure 3.1. Note that the 38657 screen adapter is connected to the SP22 PVC screen using the setscrews provided with the adapter.

and lower it into the driven casing.

2. Lower the screen into the 2.25-inch probe rod casing and add rods or riser until the screen head contacts the bottom of the tool string.

3. Ensure that at least 48 inches (1219 mm) of rods or riser protrudes from the top 2.25-inch probe rod.

4. Maneuver the probe assembly into position for pulling.

5. Raise (pull) the outer 2.25-inch tool string while physically holding the screen in place with the inner 1.25-inch rods or 0.75-inch riser. A slight knock with the inner tool string will help to dislodge the expendable point and start the screen moving inside the probe rod.

   Raise the hammer and outer tool string to expose the desired length of screen. The inner rods will begin raising with the outer rods when the screen adapter contacts the necked portion of the expendable point holder or DT22 Cutting Shoe. Use care when deploying a PVC screen so as not to break the screen when it contacts the expendable point.

6. Remove the rod grip handle, lower the hammer assembly, and retract the probe derrick. Remove the top 2.25-inch probe rod.

7. Groundwater samples can now be collected with a mini-bailer, peristaltic or vacuum pump, tubing bottom check valve assembly, bladder pump, or other acceptable small diameter sampling device.

   When inserting tubing or a bladder pump down the rod string, ensure that it enters the screen interval. The leading end of the tubing or bladder pump will sometimes catch at the screen head giving the illusion that the bottom of the screen has been reached. An up-and-down motion combined with rotation helps move the tubing or bladder pump past the lip and into the screen.

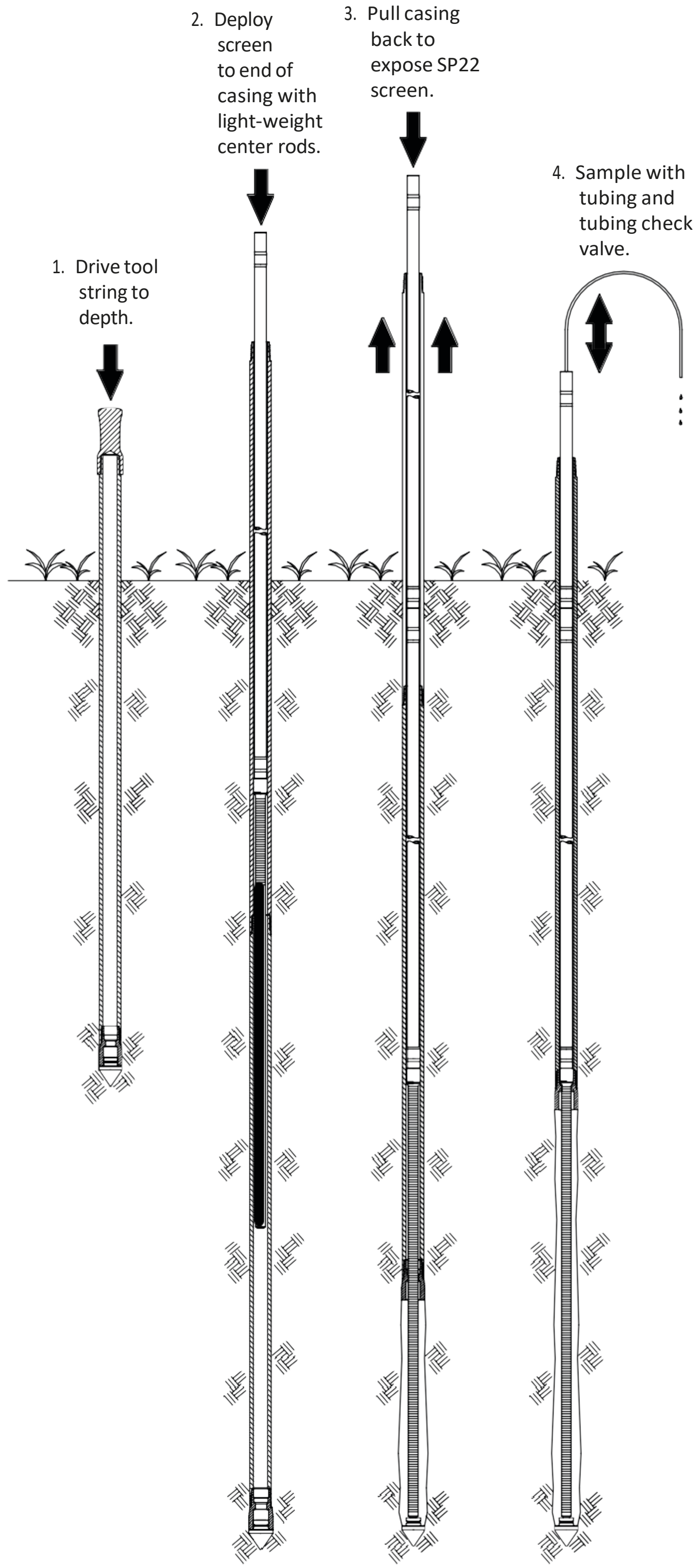

FIGURE 4.2
Screen Deployment for SP22 Sampler

4.6 Abandonment Grouting for SP22 Screens

The SP22 Sampler can meet ASTM D 5299 requirements for abandoning environmental wells or borings when grouting is conducted properly. A removable grout plug makes it possible to deploy tubing through the bottom of the SP22 screens, but the easiest method is to remove the inner string of rods; including the SP22 screen. A Grout Machine is then used to pump grout into the open probe hole as the outer casing is withdrawn. The following procedure is presented as an example only and should be modi!ed to satisfy local abandonment grouting regulations. (Figure 4.3)

1. Maneuver the probe assembly into position for pulling.

2. High-Pressure Nylon Tubing (11633) is inserted down through the probe rods through the bottom of the expendable point holder (Fig. 4.3).

   Note: All probe rods remain strung on the tubing as the tool string is pulled. Provide extra tubing length to allow suf!cient room to lay the rods on the ground as they are removed. An additional 20 feet is generally enough.

3. Operate the grout pump while pulling the !rst rod with the rod grip pull system. Coordinate pumping and pulling rates so that grout !lls the void left by the sampler. After pulling the !rst rod, release the rod grip handle, fully lower the hammer, and regrip the tool string. Unthread the top probe and slide it over the tubing placing it on the ground near the end of the tubing.

4. Repeat Step 5 until the tool string is retrieved. Do not bend or kink the tubing when pulling and laying out the probe rods. Sharp bends create weak spots in the tubing which may burst when pumping grout. Remember to operate the grout pump only when pulling the rod string. The probe hole is thus !lled with grout from the bottom up as the rods are extracted.

5. Promptly clean all probe rods and sampler parts before the grout sets up and clogs the equipment.

4.7 Retrieving the Screen Point 22 Sampler

If grouting is not required, the Screen Point 22 Sampler can be retrieved by pulling the probe rods as with most other Geoprobe® applications. The Rod Grip Pull System should be used for this process as it allows the operator to remove rods without completely releasing the tool string. This avoids having the probe rods fall back downhole when released during the pulling procedure. A standard Pull Cap (33622) may still be used if preferred. Refer to the Owner's Manual for your Geoprobe® direct push machine for speci!c instructions on pulling the tool string.

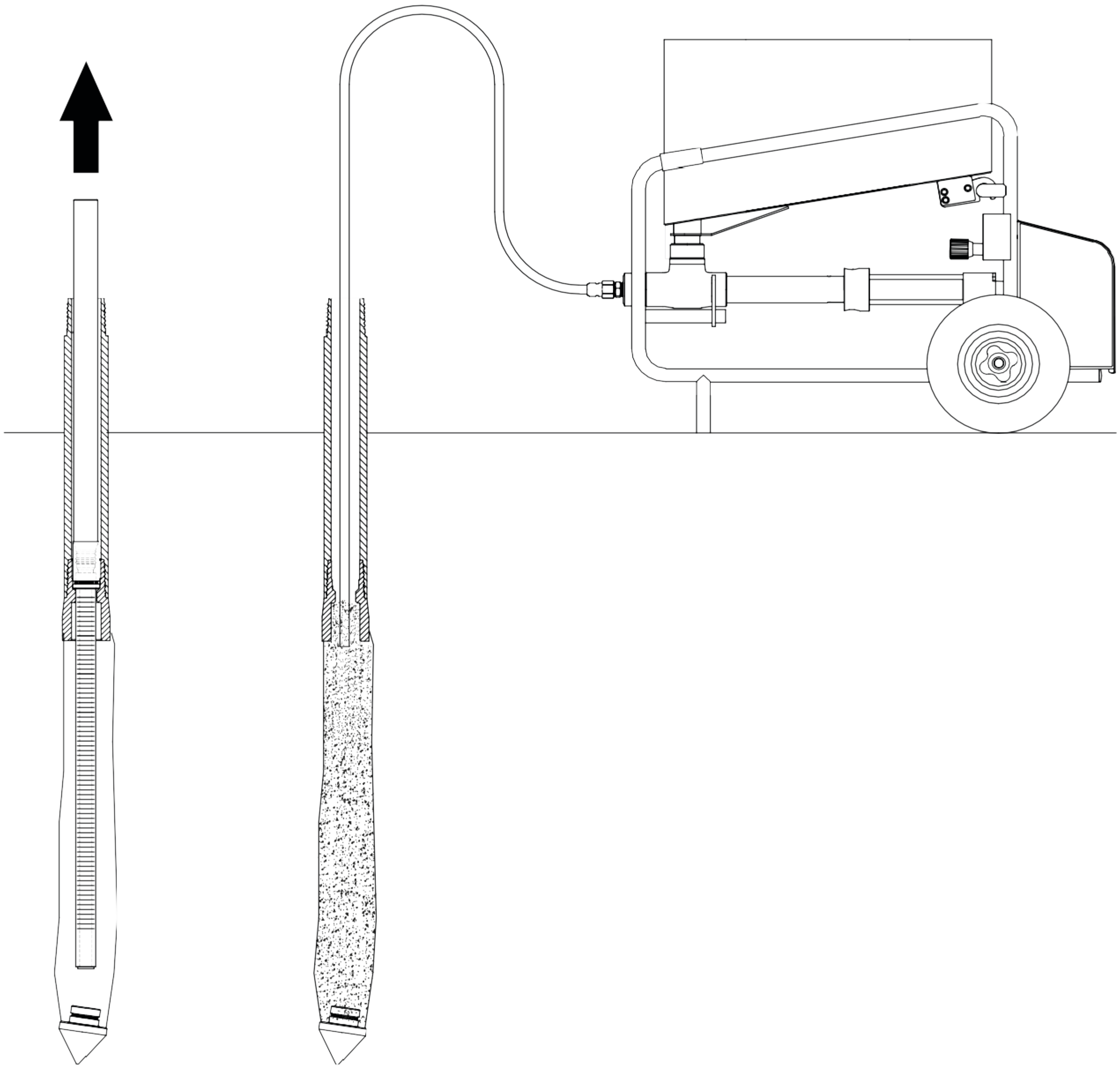

FIGURE 4.3
Abandonment Grouting for the SP22 Sampler

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Equipment and tool speci!cations, including weights, dimensions, materials, and operating speci!cations included in this brochure are subject to change without notice. Where speci!cations are critical to your application, please consult Geoprobe Systems®.

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TGI – Sediment, Surface Water, and Stormwater Sample Collection for PFAS Analysis

Rev: 4

Rev Date: May 20, 2024

ARCADIS

Version Control

Issue	Revision No.	Date Issued	Page No.	Description	Reviewed By
	0	October 5, 2018	All	Combined aspects of generic Sediment Sample Collection TGI (Rev 0, June 18, 2018) and Stormwater Sampling TGI (Rev 0, August 29, 2018). Added surface water collection guidance and made this TGI PFAS-specific. Added stormwater and surface water sections; made PFAS- specific	Shannon Dunn
	1	March 27, 2020	15, 16	Revised the depth criteria to 0.5 to 1 feet for shallow surface water and >1 for deeper surface water	Shannon Dunn
	2	October 15, 2020	15, 16	Added Air Force preference to sample surface water at surface for Air Force investigations.	Erika Houtz
	3	June 22, 2022	All	Updated with new TGI Template	QMS
	4	May 20, 2024		Revised Table 1 and Table 2 and text. Updated reference section.	Shannon Dunn

Approval Signatures

Prepared by: 5/20/2024

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Hilda Fadaei, Project Environmental Engineer (Preparer) — Date

Reviewed by: 5/20/2024

Shannon Dunn

Shannon Dunn, Assistant Vice President (Subject Matter Expert) — Date

1 Introduction

This Technical Guidance Instruction (TGI) describes the procedure for collection of sediment, surface water, and stormwater samples for per- and polyfluoroalkyl substances (PFASs) analysis.

2 Intended Use and Responsibilities

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, regulation-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

3 Scope and Application

This Technical Guidance Instruction (TGI) describes the collection of sediment, surface water, and stormwater samples, including field screening and logging of sediment samples. Sediment samples will be collected using a hand-held dredge, push cores, and/or stainless-steel scoop or trowel (the proper technique will be selected in the field depending on site conditions) for the laboratory analysis of sediment chemistry samples. Surface water and stormwater samples will be collected using direct-fill methods or peristaltic pumps. The general procedures to be utilized in obtaining sediment, surface water, and stormwater samples are outlined below. The intent of this TGI is to provide instructions for sampling during United States Army Environmental Command (USAEC) PFASs Preliminary Assessment and Site Inspection (PA/SI) at various installations. It also covers specific considerations for PFASs due to their unique chemical and physical properties, low detection limits, and regulatory standards.

This TGI may change depending upon field conditions, equipment limitations, or limitations imposed by the procedure. Substantive modification to this TGI will be approved in advance by the Project Manager.

4 Personnel Qualifications

All field personnel must have the appropriate training required by Arcadis as described in the project Site Safety and Health Plan (SSHP). Arcadis field sampling personnel will be trained in proper sampling procedures under the guidance of an experienced field geologist, engineer, or technician. Arcadis field sampling personnel will also be versed in the relevant TGIs and standard operating procedures (SOPs) necessary to successfully complete the desired field work.

5 Equipment List

The following materials will be available, as required, during sampling. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- Site plan with proposed sampling locations;
- Relevant work plan (e.g., Programmatic Quality Assurance Project Plan [PQAPP]); SSHP;
- Health and Safety equipment, as required by the site SSHP and task-specific Job Safety Analysis; Sediment Sampling Equipment:
    - Boat with outboard motor and associated equipment (as necessary);
    - Global Positioning System (GPS) unit;
    - Navigation chart(s) for on-water activities (if available and as applicable);
    - Stainless-steel hand-held dredge (6-inch x 6-inch Ekman or Petite Ponar);
    - Lexan™ tubes (4-inch) and PFAS-free plastic caps;
    - Stainless-steel bowl;
    - Stainless-steel spatula, scoop, bent spoon, or trowel;
    - Steel core driver (i.e., slide hammer);
    - YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, oxidation reduction potential (ORP), and dissolved oxygen (DO);
    - Supplemental turbidity meter;
    - Stainless-steel probe rod – for evaluating bottom softness when wading to sampling locations;
    - Polypropylene twine/rope;
    - Hacksaw with stainless steel blade;
    - Tape measure;
    - Stainless steel, polyvinyl chloride (PVC) or high-density polyethylene (HDPE) yard stick for measuring water depth;
    - Stainless-steel extension rod (if necessary to extend reach of scoop or trowel);
    - Rubber boots or rubber waders (only non-coated rubber, other more high-tech waterproof material is not permitted);
    - Life jacket or other personal flotation device (PFD) as necessary based on water depth (note, these will likely have PFAS-containing materials so need to be careful to avoid cross- contamination when using).

- Surface Water Sampling Equipment:
    - If not using direct-fill method:
        - ISCO Model 150 peristaltic pump;
        - Rechargeable marine or car battery (for peristaltic pump);
        - Dedicated HDPE and silicon tubing (Teflon® or polytetrafluoroethylene [PTFE] tubing is prohibited);
        - Stainless steel rod (1/4-inch diameter x 4-feet long or similar) to support HDPE sampling tubing;
        - HDPE zip ties (nylon zip ties are not allowed) to attach tubing to rod;
        - YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO;
        - Supplemental turbidity meter;
        - Pail or bucket with closable lid for pump discharge;
    - Rubber boots or rubber waders (only non-coated rubber, other more high-tech waterproof material is not permitted);
    - Life jacket or other PFD as necessary based on water depth (note, these will likely have PFAS-containing materials so need to be careful to avoid cross-contamination when using).
- Stormwater Sampling Equipment:
    - Wrench, socket, manhole cover hook or magnetic manhole cover remover for access;
    - Approximately 1-inch outer diameter Lexan™ pipe long enough to extend from bottom of storm drain to at least 2 feet above the manhole;
    - HDPE zip ties (nylon zip ties are not allowed) to attach tubing to the Lexan™ pipe;
    - Tape measure;
    - ISCO Model 150 peristaltic pump;
    - Rechargeable marine or car battery (for peristaltic pump);
    - Dedicated HDPE and silicon tubing (Teflon® or PTFE tubing is prohibited);
    - YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO;
    - Supplemental turbidity meter;
    - Pail or bucket with closable lid for pump discharge.
- Appropriate sample containers and labels:
    - Labeled sample bottles: see the TGI - Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2023a) for PFAS-specific considerations;
    - 1-quart and 1-gallon polyethylene bags (Ziploc® brand only) to hold ice and samples;
    - Appropriate blanks (field reagent blanks supplied by the laboratory);
    - Packing and shipping materials;
    - Chain-of-Custody (COC) Forms; see the Sample Chain of Custody Standard Operating Procedure (SOP) for reference (Arcadis 2022b);
    - Appropriate transport containers (coolers) with ice and appropriate labeling, no blue ice;
      Decontamination/Water Management:

- PFAS-free decontamination fluids and equipment
  - HDPE or PVC brushes and squirt bottles;
  - Stainless steel bowl;
  - HPDE buckets to hold decontamination fluids;
  - Alconox® or Liquinox® (other detergents are prohibited);
  - Methanol or isopropyl alcohol (for sediment sampling equipment decontamination only);
  - Distilled or laboratory-supplied deionized water;
  - Laboratory-provided PFAS-free water.
- See the TGI - Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2023a) or the TGI - Groundwater and Soil Sampling Equipment Decontamination (Arcadis 2023c) for additional guidance;
- Portable field hand washing setup;
- Non-hazardous drum labels as required for investigation-derived waste handling: see the TGI - Investigation-Derived Waste Handling and Storage for details (Arcadis 2020);

- Field Notes:
  - Regular ball point pens and/or pencils, for writing;
  - Appropriate field forms;
  - Non-plastic clipboards, field binders, non-spiral field notebook, and field note pages that are not waterproof or treated;
  - Digital camera. Other
  - Garbage bags;
  - Paper towels;
  - Duct and packing tape;
  - Dedicated low-density polyethylene (LDPE) plastic sheeting to prevent sample contact with the ground;
  - Field clothing made of cotton or other natural fibers that is well laundered (i.e., washed at least 5 times);
  - PFAS-free sunscreen and insect repellant.

6 Cautions

6.1 Utility Clearance

Sediment sampling requires a minimum of three reliable lines of evidence for utility clearance to demonstrate that sample locations are clear of subsurface utilities. A site visit for public utility line clearance at the proposed boring locations will be conducted at least 72 hours prior to work commencing. As applicable, utility maps will be reviewed during field reconnaissance of the proposed inspection locations to determine if any are co-located with public utility lines. Arcadis will also contract an independent geophysical survey company to verify, if possible, that proposed boring locations are not co- located with existing underground utility/substructure features. See the Utility Location and

Clearance Arcadis Health and Safety Standard (Arcadis 2022c), including Supplement 6 Utility Location Procedures for Aquatic Work Activities, for reference.

6.2 PFAS-Specific General Sampling Considerations

This section provides a summary of methods and procedures applicable to the collection of environmental samples for field screening or laboratory analysis during PFAS site characterization activities. In general, sampling techniques used for PFAS site characterization are consistent with conventional sampling techniques used in the environmental industry, but special consideration is made regarding PFAS- containing materials and cross-contamination potential. For example, Teflon™ and other fluoropolymer containing materials are found in pumps, tubing, and sample storage containers and therefore should be avoided if possible (Department of Environment Regulation [DER], Western Australia 2016; New Hampshire Department of Environmental Services [NHDES] 2016). Certain field documentation materials such as waterproof paper or field books, adhesive paper products, and some writing utensils (grouped as Sharpie® markers) are also prohibited items during PFAS sampling (DER 2016; NHDES 2016).

New nitrile gloves should be donned before any of the following activities:

- Decontamination of re-usable sampling equipment;
- Contact with sample bottles or PFAS-free water bottles;
- Handling clean sample tubing or connecting tubing;
- Handling QC samples including field blanks and equipment blanks.

Additionally, new nitrile gloves should also be donned after handling of any non-dedicated sampling equipment; contact with contaminated surfaces; and whenever judged necessary by field personnel. When in doubt change your gloves.

Waterproof field books must not be used for field notes. Instead, field notes should be on loose paper on Masonite, plastic, or aluminum clip boards. Other requirements for field notes include:

- Keep field notes, writing implements, and electronic data collection tablets away from samples and sampling materials; and
- Do not write on sampling bottles unless they are closed.

Tables 1 and 2 in Attachment 1 provides recommendations for PFAS Site Inspection equipment. Table 1 provides a summary of materials that have been approved for site inspection; this list is expected to grow longer as industry experience increases. Table 2 provides a summary of field equipment and materials that have available testing information and/or industry knowledge regarding PFAS cross- contamination potential and it is recommended that these materials be prohibited for sample collection. For materials that are suspected of containing PFASs and/or retaining PFASs, these recommendations are considered preliminary and subject to change.

Given the extremely low detection limits associated with PFAS analysis and the many potential sources of trace levels of PFASs, field personnel are typically advised to err on the side of caution by strictly following field wear guidelines and decontamination procedures as specified in the Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2023a).The most important consideration during PFAS-related sampling is to prevent contact between sample media and suspect PFAS sources.

6.3 PFAS-Specific Sediment Sampling

Because of the potential presence of PFASs in equipment typically used to collect samples, consideration for other sampling materials that contact sediment through the sampling process is necessary. Each piece of equipment that comes into direct contact with the sediment needs to be evaluated to determine if there are either PFAS-containing materials present, which could be a source of cross-contamination and cause false positives, or if PFASs adhere to the material, which has the potential to cause low bias sample results. For each additional piece of equipment that may introduce contamination, an equipment blank should be collected to confirm that materials in the sample equipment do not cause false positives by introducing PFASs. Equipment blanks are particularly important for any device/component where PFASs may be present or cannot be verified as being a non-PFAS containing material. Other quality assurance methods may be implemented to avoid materials that could result in potential losses associated with PFASs adhering to surfaces.

The following additional notes are provided regarding sediment sampling materials:

- Lexan™ liner sleeves are made of polycarbonate and they are not expected to contain PFASs based on review of the Safety Data Sheet (Sabic 2016).
- Studies evaluating the use of stainless steel indicate that PFASs do not strongly sorb to stainless- steel (Obal et al. 2012). Therefore, stainless-steel sleeves and equipment should be acceptable for collection of sediment samples for PFAS analysis.

6.4 PFAS-Specific Surface Water and Stormwater Sampling

As described for sediment sampling, the potential presence of PFASs in equipment that may come in contact with the target water sample must be evaluated as part of the sample planning process to maintain sample integrity.

Note that if high concentrations of PFASs related to Class B firefighting foams are expected in a surface water sample, it has been recommended to collect and shake a small portion of the sample at the time of sample collection (USACE 2016; Arcadis 2023a). If foaming is noted within the sample, it indicates elevated concentrations of PFASs may be present and the sample should be proactively diluted at the laboratory prior to analysis. The foaming should be noted on the sample COC form. It is recommended to collect sampling equipment blanks following foam observation to confirm the effectiveness of decontamination procedures.

While permissible during fog or intermittent showers, surface water samples should not be collected during steady, prolonged rainfall. Avoid entraining sediment in surface water samples. If accessing the sample location from water, approach slowly from downstream to avoid disturbing the bottom.

7 Health and Safety Considerations

Field activities associated with sediment, surface water, and stormwater sampling and description will be performed in accordance with a site-specific SSHP, a copy of which will be present on site during such activities. Additional health and safety discussions are specifically discussed below.

7.1 Sediment Sampling

- Walk established paths whenever possible to avoid slip/trip hazards. Take your time and watch your footing.

- A PFD may be required to complete sediment sampling. Review the Arcadis Water Operations Health and Safety Standard and the SSHP to determine if a PFD is required.
- To the extent possible, maintain three points of physical contact (i.e., two feet and one hand, or one foot and two hands) when entering and exiting a stream channel.
- Ensure the state One Call has been completed and the Arcadis Utilities and Structures Checklist is completed before sampling.
- Take breaks as needed to avoid repetitive use injury or muscle strain and take turns with co- workers as needed.
- Do not touch sediments with bare hands or detect odors by placing sediments close to your nose.
- STOP WORK when conditions change or become unsafe and discuss if/how to proceed safely before resuming work.
- If boats are required for sampling, the following considerations should be made:
    - Good housekeeping and three-points of physical contact should be maintained when entering/exiting the boat to prevent falls or trips;
    - Boat operator will be properly trained;
    - To avoid impact with other water traffic, ensure navigational lighting is functional (if applicable). Be vigilant and maintain situational awareness of other water traffic.

7.2 Surface Water Sampling

- A PFD may be required to complete surface water sampling. Review the Arcadis Water Operations Health and Safety Standard and the SSHP to determine if a PFD is required.
- Always have three points of contact when entering and exiting a stream channel, if necessary.
- If boats are required for sampling, the following considerations should be made:
    - Good housekeeping and three-points of physical contact should be maintained when entering/exiting the boat to prevent falls or trips;
    - Boat operator will be properly trained;
    - To avoid impact with other water traffic, ensure navigational lighting is functional (if applicable). Be vigilant and maintain situational awareness of other water traffic.

7.3 Stormwater Sampling

- The ability to safely access the stormwater sampling vaults or manholes should be verified prior to sampling. Confined space entry is not allowed.

8 Procedure

8.1 Sediment Sampling

Sediment samples will be collected by one of the following methods considered most appropriate for the site conditions.

- Hand-held scoop or trowel – for shallow water depths (e.g., < 2 feet) that are nearshore and that sediment conditions preclude sampling by push core or grab sampler.
- Push core – for sampling in deeper water (e.g., > 2 feet) or offshore.
- Petite Ponar Grab Sampler – for sampling in deeper water offshore with coarse sediment or hard bottom.

Sampling Mobilization/Prep

- Don personal protective equipment (PPE) as discussed in Section 5.2 and the Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2023a).
- Mobilize to sampling location.
    - If accessing by wading, approach slowly from a downstream direction to limit disturbance of the bottom and resulting suspension of sediment into the surface water at sampling location.
    - If accessing by boat, maneuver to the target sample location using GPS and secure the vessel in place.
- Identify the proposed sample location in the field notebook along with other appropriate information (e.g., location, date, time, personnel, weather).
- Verify all dedicated sample gear has been properly decontaminated as discussed in Section 10.
- Measure and record water depth at the sampling location.

Sample Collection by Stainless Steel Scoop or Trowel

- Attach stainless steel scoop, bent spoon, or trowel to a stainless-steel extension rod (if needed) and lower vertically downward through the water column until it reaches the bottom. Collect sediment from the top 2 inches (5 centimeters [cm]) of the bottom surface.
- Retrieve the scoop, bent spoon, or trowel. Slowly decant overlying water and take care to prevent fine sediment from being poured out with the water. Inspect recovered sediment to confirm it does not contain vegetation (e.g., grass, leaves, sticks or similar undecomposed organic material). Use the stainless-steel trowel to remove any vegetation prior to filling sample bottles. If the sample contains too much vegetation to be removed effectively, collect another sediment sample from the bottom.
- Place the sediment in a decontaminated stainless-steel bowl.
- Photograph the grab sample to provide reference for post-processing questions regarding descriptions of color/staining, general texture, recovery, and other characteristics. Photos of the sample will include the grab sample ID, date, and time, written on loose paper with a non-Sharpie® marker. The photo will also include a view of a tape measure for scale.
- Describe lithology of recovered sediment in accordance with Arcadis TGI for Soil Descriptions (Arcadis 2023b).
- Homogenize the sediment with a stainless-steel mixing spoon until the sediment is of uniform color.
- Collect sediment samples. If additional sediment is needed to fill the bottles, collect additional sample volume approximately 1-2 feet upstream from the first to minimize disturbance.
- Measure surface water pH, conductivity, temperature, and turbidity at the sampling location and record on sampling forms.
    - Use YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO.
    - Use the supplemental turbidity meter to measure turbidity.

Sample Collection by Push Core

- Lower section of clean Lexan™ tube (at least as long as the target sediment penetration depth plus the water depth) until it contacts the top of the sediment.
- Push Lexan™ tube with a straight vertical entry into the sediment to a depth of approximately 4 inches (10 cm) below the sediment surface. If necessary, drive the tube a few more inches down into the sediment either by hand or using a steel core driver to obtain a plug at the bottom of the core that will prevent the sediment from falling out during core retrieval. Note that only the top 2 inches (5 cm) of soil will be used for laboratory sampling.
- Place a cap made of PFAS-free materials (e.g., HDPE, silicon) on the top of the sediment tube and slowly pull the tube from the sediment, twisting it slightly as it is removed (if necessary)
- Before the tube is fully removed from the water, place a PFAS-free cap on the bottom end of the tube while it is still submerged. Ensure that the bottom end cap fits tightly and will not inadvertently slip off. Remove the tube from the water.
- Keeping the tube upright, wipe the bottom end dry and double check that the bottom cap is tight. If necessary (e.g., walking away from the sampling area to a more secure area to fill sample jars), keep one hand beneath the bottom cap to prevent the cap from falling off. Measure the length of sediment recovered and evaluate the integrity of the core.
- While keeping the core upright, use a hacksaw to make a horizontal cut in the tube approximately 2 - 3 inches above the sediment and carefully drain water from the core to prepare it for inspection and sampling.
    - Note: If possible, use a section of Lexan TM tubing short enough to allow for sampling without cutting the core. This is only possible in shallow water conditions, as the Lexan TM tubing should be at least long enough to keep the top of the tube above water.
- Slowly decant overlying water and take care to prevent fine sediment from being poured out with the water. Inspect recovered sediment to confirm it does not contain vegetation (e.g., grass, leaves, sticks or similar undecomposed organic material). Use the stainless-steel trowel to remove any vegetation prior to filling sample bottles. If the sample contains too much vegetation to be removed effectively, collect another sediment sample from the bottom.
- Using a stainless-steel bent spoon, scoop, or trowel, place the top 2 inches (5 cm) of sediment in a decontaminated stainless-steel bowl.
- Photograph the grab sample to provide reference for post-processing questions regarding descriptions of color/staining, general texture, recovery, and other characteristics. Photos of the sample will include the grab sample ID, date, and time written on loose paper with a non-Sharpie® marker. The photo will also include a view of a tape measure for scale.
- Describe the lithology of recovered sediment in accordance with Arcadis TGI for Soil Descriptions (Arcadis 2023b).
- Homogenize the sediment with a stainless-steel mixing spoon until the sediment is of uniform color.
- Collect sediment samples. If additional sediment is needed to fill the bottles, collect additional sample volume approximately 1-2 feet upstream from the first to minimize disturbance.
- Measure surface water pH, conductivity, temperature, and turbidity at the sampling location and record on sampling forms.
    - Use YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO.
    - Use supplemental turbidity meter to measure turbidity.

Sample Collection by Petite Ponar Grab Sampler

- Use polypropylene twine/rope with the dredge or similar PFAS-free approved material.
- Set the stainless-steel Petite Ponar grab sampler dredge and slowly lower the open dredge from the side of the boat until it is just above the top of the sediment surface. Then drop the open dredge into the sediment.
- Once the dredge has been allowed to settle into the bottom sediment, pull hard on the rope, or send the messenger to trigger the dredge and close the sediment inside.
- Retrieve the dredge onto the boat.
- Inspect the sample for acceptability in accordance with the following criteria:
    - Sampler is not overfilled with sample such that the sediment surface presses against the top of the sampler or is extruding through the top of the sampler.
    - Overlying water is present above the sediment (indicates minimal leakage).
    - At least 4 inches (10 cm) of sediment penetration depth has been achieved.
- Tilt the dredge over slightly to drain the overlying water to prepare the sediment for inspection and sampling, being careful not to disturb the recovered sediment. Also take care to prevent fine sediment from being poured out with the water.
- Inspect recovered sediment to confirm it does not contain vegetation (e.g., grass, leaves, sticks or similar undecomposed organic material). Use the stainless-steel trowel to remove any vegetation prior to filling sample bottles, if possible, to do so with minimum disturbance of the recovered sediment. If the sample contains too much vegetation to be removed effectively without disturbing sediment, collect another sediment sample from the bottom.
- Using a stainless-steel bent spoon, scoop, or trowel, place the top 2 inches (5 cm) of sediment in a decontaminated stainless-steel bowl.
- Photograph the grab sample to provide reference for post-processing questions regarding descriptions of color/staining, general texture, recovery, and other characteristics. Photos of the sample will include the grab sample ID, date, and time written on loose paper with a non-Sharpie® marker. The photo will also include a view of a tape measure for scale.
- Describe the lithology of recovered sediment in accordance with Arcadis TGI for Soil Descriptions (Arcadis 2023b).
- Homogenize the sediment with a stainless-steel mixing spoon until the sediment is of uniform color.
- If additional sediment volume is needed to fill sample bottles, redeploy the dredge 1 – 2 feet upstream from the previous sampling location.
- Measure surface water pH, conductivity, temperature, and turbidity at the sampling location and record on sampling forms.
    - Use YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO.
    - Use supplemental turbidity meter to measure turbidity.

Laboratory Sample Collection/Management, Post-Sampling

- Fill the sample bottle for PFAS analysis first, then fill bottles for any remaining analyses.

- Don clean nitrile gloves and use a stainless-steel trowel to fill clean labeled bottles supplied by the laboratory for the required analyses with sediment. Collect lab samples from the top 5 cm of the recovered 10 cm interval only. Do not overfill bottles.
- Make sure caps remain on PFAS sample bottles until immediately prior to filling. Caps must remain in the hand of the sampler until replaced on the bottle.
- Once the PFAS sample has been placed in the bottle, and the bottle cap has been completely tightened, label the sample with sample identification number, date, and time of collection. Labels must be completed only after the caps have been placed back on each bottle. (See P-01 QP#3.06 Field Activities documentation for sample label information).
- Collect QC samples at the frequency specified in Quality Assurance Project Plan (QAPP) Addendum Worksheet #20. QC sample locations are to be selected based on consultation with the Arcadis Regional Lead (RL). Note, if using waders to access sampling locations, collect equipment blank off of the waders.
- Record the label information and time of sampling in the field notes and sampling forms.
- Fill out the laboratory COC and check against the labels on the sample bottles progressively after each sample is collected.
- Place the sample bottles in a sealed Ziploc© bag, and then into sample coolers. Store PFAS samples in separate cooler from other samples.

8.2 Surface Water Sampling

Sampling Mobilization/Prep

- Don PPE as discussed in Section 5.2 and the Poly- and Perfluorinated Alkyl Substances (PFAS) Field Sampling Guidance (Arcadis 2023a).
- Mobilize to sampling location.
    - If accessing by wading, approach slowly from downstream direction to limit disturbance of bottom and resulting suspension of sediment into the surface water at the sampling location.
    - If accessing by boat, maneuver to the target sample location using GPS and secure the vessel in place.
- Identify the proposed sample location in the field notebook along with other appropriate information (e.g., location, date, time, personnel, weather).
- Verify all dedicated sample gear has been properly decontaminated as discussed in Section 10.
- Measure and record water depth at the sampling location.
- Do not sample surface water when it is raining. Fog or intermittent showers are okay, but not steady rainfall. Avoid entraining sediment in surface water samples.

Shallow Surface Water (0.5 – 1 feet)

- Cut a length of new HDPE tubing to the appropriate size for desired sampling depth and pump location and attach to stainless steel rod using HDPE zip ties. Insert a new length of silicon tubing into the peristaltic pump and connect HDPE tubing on intake side and a shorter length of new HDPE tubing on discharge side.
- Direct pump discharge into pail/bucket during sampling.

- For general PFAS investigation, lower the HPDE tubing on intake side of pump to the desired depth in the water column. For water depths < 1 ft, place tubing intake at approximately mid- depth of the water column.
- For Air Force investigations, place the HDPE tubing on intake at the surface. Collect samples from the water surface.
- Do not disturb sediment at bottom of water body with sampling equipment, as this could cause suspension of sediment into the surface water that could introduce cross contamination into the sample.
- Verify pump flow direction and turn on pump.
- Once water fills the tubing and begins flowing out of the discharge end turn off pump and prepare to sample.
- Don fresh set of nitrile gloves. Disconnect HDPE tubing from silicon tubing on discharge end. Keep silicon tubing in clean gloved hand and do not allow it to contact any surfaces or equipment. Turn on pump and fill sample bottle to the neck directly from silicon tubing, headspace is acceptable. Do not rinse PFAS sample bottles during sampling.
- Only use labelled HDPE bottles that are supplied by the laboratory. Make sure the cap remains on the bottle until immediately prior to sample collection and gets placed back on the bottle immediately after sample collection. Do not place the cap on any surface, and keep cap in gloved hand opposite of sample collection, do not touch the inside of the cap.
- Measure surface water pH, conductivity, temperature, and turbidity at the sampling location and record on the sampling forms.
    - Use YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO.
    - Use supplemental turbidity meter to measure turbidity.

Deeper Surface Water (>1 feet)

- Don fresh set of nitrile gloves immediately prior to collecting samples. Use nitrile glove with long cuff that covers the forearm, as this will help avoid submerging clothing or skin during sampling.
- Only use labelled HDPE bottles that are supplied by the laboratory. Do not rinse PFAS sample bottles prior to collecting sample. Do not remove cap prior to or after sample collection. Do not place the cap on any surface, and keep cap in gloved hand opposite of sample collection, do not touch the inside of the cap.
- Facing the upstream direction (if the surface water body is flowing), place sample container in freshly gloved hand and gently submerge the sample container beneath the water surface with the cap on. For Air Force investigations, the bottle should be submerged at the water surface.
- Tilt the container so the mouth is angled slightly upward, then with the other gloved hand gently unscrew the cap, open it a crack and allow water to flow slowly down the inner wall of the container filling it. For Air Force investigations, the mouth should be at the surface.
- Do not submerge hands below top of gloves during sampling such that clothing or bare skin of sampling personnel comes into contact with the surface water.
- When the sample container is full, replace and tighten the cap while the container is still submerged, then remove it from the water.
- Measure surface water pH, conductivity, temperature, and turbidity at sampling location and record on sampling forms.

  - Use YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO.
  - Use supplemental turbidity meter to measure turbidity.

Laboratory Sample Management, Post-Sampling

- Once the PFAS sample has been placed in the bottle, and the bottle cap has been completely tightened, label the sample with sample identification number, date, and time of collection. Labels must be completed only after the caps have been placed back on each bottle. (See P-01 QP#3.06 Field Activities documentation for sample label information).
- Collect QC samples at the frequency specified in the QAPP Addendum Worksheet #20. QC sample locations are to be selected based on consultation with the Arcadis RL. Note, if using waders to access sampling locations, collect equipment blank off of the waders.
- Record the label information and time of sampling in the field notes and sampling forms.
- Fill out the laboratory COC and check against the labels on the sample bottles progressively after each sample is collected.
- Place sample bottles in a sealed Ziploc® bag, and then into sample coolers. Store PFAS samples in separate cooler from other samples.

8.3 Stormwater Sampling

The following general guidelines apply when sampling stormwater.

- Sampling should be started from the manhole farthest downstream and work upstream. This mitigates the impact of subsequent samples if anything on the bottom is disturbed and migrates downstream.
- Care should be taken not to disturb the bottom sediments in catch basin sumps or other storm water sampling locations.
- Stormwater samples should only be collected from active flow. Stormwater will not be collected from pools or standing water.
- Use the following procedure to collect grab stormwater samples.
- Verify all dedicated sample gear has been properly decontaminated as discussed in Section 10.
- Mobilize to stormwater sampling location.
- Confirm that active flow is entering the sampling space.
- Measure the depths from the top of the manhole to the top of the stormwater surface and to the bottom of the stormwater system with a tape measure (do this downstream from the spot where the sample will be collected).
- Subtract the depth of the water surface from the depth of the stormwater system. This is the thickness of the stormwater column. Divide the thickness by two. Add the result to the depth of the stormwater surface. This is the sampling depth.
- Strap the HDPE sampling tubing to the Lexan TM pipe using the HDPE zip ties.
- Place a HDPE zip tie on the Lexan TM pipe that marks the sampling depth, as measured above. This HDPE zip tie will be used as a marker to guide how far to insert the pipe and tubing into the manhole. The HDPE zip tie marker will prevent over inserting the Lexan TM pipe and tubing and thus prevent disturbing the deposited sediment in the stormwater system.

- Attach the other end of the tubing (the end that will not be placed into the stormwater for sampling) to the peristaltic pump.
- Collect active flow sample.
  - Slowly lower the Lexan TM pipe and tubing into the stormwater system to the sample collection depth, using the marker HDPE zip tie as a guide.
- Verify pump flow direction and turn on pump.
- Once water fills the tubing and begins flowing out of the discharge end turn off pump and prepare to sample.
- Don fresh set of nitrile gloves. Disconnect HDPE tubing from silicon tubing on discharge end. Keep silicon tubing in clean gloved hand and do not allow it to contact any surfaces or equipment. Turn on pump and fill sample bottle to the neck directly from silicon tubing, headspace is acceptable. Do not rinse PFAS sample bottles during sampling.
- Only use labelled HDPE bottles that are supplied by laboratory. Make sure that the cap remains on the bottle until immediately prior to sample collection and gets placed back on the bottle immediately after sample collection. Do not place the cap on any surface, and keep cap in gloved hand opposite of sample collection, do not touch the inside of the cap.
- Measure surface water pH, conductivity, temperature, and turbidity at the sampling location and record on sampling forms.
  - Use YSI 6-Series Multi-Parameter Instrument water quality meter with flow-through cell for monitoring temperature, conductivity, ORP, and DO.
  - Use supplemental turbidity meter to measure turbidity.

Laboratory Sample Management, Post-Sampling

- Once the PFAS sample has been placed in the bottle, and the bottle cap has been completely tightened, label the sample with sample identification number, date, and time of collection. Labels must be completed only after the caps have been placed back on each bottle. (See P-01 QP#3.06 Field Activities documentation for sample label information).
- Collect QC samples at the frequency specified in the QAPP Addendum Worksheet #20. QC sample locations are to be selected based on consultation with the Arcadis RL. Note, if using waders to access sampling locations, collect equipment blank off of the waders.
- Record the label information and time of sampling in the field notes and sampling forms.
- Fill out the laboratory COC and check against the labels on the sample bottles progressively after each sample is collected.
- Place sample bottles in a sealed Ziploc® bag, and then into sample coolers. Store PFAS samples in separate cooler from other samples.

9 Waste Management

Investigation-derived waste (IDW) including excess sediment, surface water, stormwater and decontamination fluids will be collected and placed in Department of Transportation approved containers, segregated by waste streams: see the Investigation-Derived Waste Handling and Storage TGI for details (Arcadis 2020). All containers will be labeled as non-hazardous unless otherwise instructed by the Project Manager. Containerized IDW will be stored on site until it is profiled and subsequently transported to an approved facility for disposal or recycling. Waste manifests for all IDW suspected to have come into contact with PFAS should clearly note the presence of PFAS. Additional IDW sampling and management details will be provided in the site-specific QAPP Addendum and will be consistent with applicable Army policies and Army post requirements. Personal protective equipment (e.g., gloves, disposable clothing, disposable equipment) resulting from personnel cleaning procedures and soil sampling activities will be placed in plastic bags. These bags will be transferred into appropriately labeled waste containers for appropriate disposal.

10 Data Recording and Management

Digital data collection is the Arcadis standard using available FieldNow® applications that enable real-time, paperless data collection, entry, and automated reporting. Paper forms should only be used as backup to FieldNow® digital data collection and/or as necessary to collect data not captured by available FieldNow® applications. The Field Now® digital form applications follow a standardized approach, correlate to most TGIs and are available to all projects accessible with a PC or capable mobile device. Once the digital forms are saved within FieldNow®, the data is instantly available for review on a web interface. This facilitates review by project management team members and SMEs enabling error or anomalous data detection for correction while the staff are still in the field. Continual improvements of FieldNow® applications are ongoing, and revisions are made as necessary in response to feedback from users and subject matter experts.

The supervising field lead will be responsible for documenting sampling events to record all relevant information in a clear and concise format. The record of sampling events should include:

- Sample dates;
- Project name and location;
- Project number, client, and site location;
- Sampling details (e.g., field measured water quality parameters, standing water column depth);
- Sediment core log;
- Type of tools used;
- Weather conditions.

Field staff should ensure COC Forms are properly completed, and verify which PFAS analytes (e.g., just PFOS and PFOA, some or all of the 537 list) are required for analysis and note on the COC.

11 Decontamination

To avoid cross-contamination during sampling, all reusable sampling equipment will be cleaned between sampling locations as follows. Repeat these steps twice at all locations suspected of containing a Class B firefighting foam source.

Sediment Sampling

With Organic Solvent Rinse (Preferred Method)

- Don new pair of nitrile gloves prior to decontamination;
- Scrub using a plastic brush and non-phosphate soap (Liquinox® or Alconox® only);
- Double-rinse in deionized or distilled water
- Rinse once with methanol or isopropyl alcohol;

- Rinse once with PFAS-free water;
- Collect all rinsate in a sealed pail for disposal;
- Allow time to air dry prior to re-use.

Without Organic Solvent Rinse (Contingency Method)

- Don new pair of nitrile gloves prior to decontamination
- Scrub using a plastic brush and non-phosphate soap (Liquinox® or Alconox® only);
- Single-rinse in deionized or distilled water;
- Scrub using a plastic brush and non-phosphate soap (Liquinox® or Alconox® only);
- Double-rinse in deionized or distilled water and single-rinse with PFAS-free water;
- Collect all rinsate in a sealed pail for disposal;
- Allow time to air dry prior to re-use.

Surface Water/Stormwater Sampling

- Don new pair of nitrile gloves prior to decontamination
- Scrub using a plastic brush and non-phosphate soap (Liquinox® or Alconox® only);
- Double-rinse in deionized or distilled water;
- Collect all rinsate in a sealed pail for disposal;
- Allow time to air dry prior to re-use.

See additional specifics in P-04, TGI - Groundwater and Soil Sampling Equipment Decontamination in PQAPP **Appendix A.**

12 Quality Assurance

In general, the following quality assurance and quality control (QA/QC) samples should be collected:

- Equipment blanks
- Field (i.e., reagent) blanks
- Field duplicates
- Matrix spike/matrix spike duplicate

Details on QC sampling requirements (e.g., frequency of collection, types of QA/QC samples) are provided in the PQAPP and will be outlined in various Site-specific sampling scopes of work in the QAPP Addendum.

Additionally, detailed procedures related to equipment and field (i.e., reagent) blank sample collection are outlined in the Equipment and Reagent Blank Sample Collection TGI (Arcadis 2022a).

Refer to QC requirements for the project to ensure that appropriate QA/QC samples are collected. When collecting QA/QC samples, the same guidelines apply as when collecting regular samples – specifically that:

- Samples should be collected in laboratory-supplied HDPE bottles;
- Bottle caps must remain in the hand of the sampler until replaced on the bottle;
- Labels must be completed after the caps have been placed back on each bottle;

- Samples must be stored in appropriate transport containers (coolers) with ice (Ziploc®-type bags for use as ice containers) with appropriate labeling. **Do not use blue ice. Store PFAS samples in a separate cooler from other types of samples.**

13 References

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Arcadis. 2022c. TGI for Utility Locating Radio Frequency Method. Rev #4. March 3.

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Massachusetts Department of Environmental Protection (MassDEP). 2021. DRAFT Fact Sheet, Field Sampling Guidelines for PFAS Using EPA Method 537 or 537.1. June.

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United States Army Corps of Engineers (USACE). 2016. DRAFT – Standard Operating Procedure 047: Per/Poly Fluorinated Alkyl Substances (PFAS) Field Sampling. Revision: 1. March.

Attachment 1

Table 1 and Table 2: PFAS Inspection Material Recommendations

Table 1: Summary of Acceptable Sampling Equipment and Materials for PFAS Site Inspections

Sampling Materials	Additional Considerations	References
Water Sampling Materials		
High density polyethylene (HDPE) or silicone tubing materials	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
HDPE HydraSleeves™	Low density polyethylene (LDPE) HydraSleeves™ are not recommended	USACE 2016; MassDEP 2017
Drilling and Soil Sampling Materials		
PFAS-free drilling fluids	--	DER 2016
PFAS-free makeup water	Confirm PFAS-free water source via laboratory analysis prior to inspections	--
Acetate liners	For use in soil sampling	USACE 2016
Sample Containers and Storage		
HDPE sample containers with HDPE lined lids for soil and water samples	Laboratory should provide; whole bottle analysis of aqueous samples combined with a solvent rinse of bottle is recommended	DER 2016; MASDEP 2017
Ice contained in plastic (polyethylene) bags (double bagged)	--	DER2016; USAGE2016; NHDES2016; MassDEP 2017
Field Documentation		
Non-Sharpie®	--	NHDES 2016; USACE 2016; MassDEP 2017
Ball point pens	--	MassDEP 2017
Standard paper and paper labels	--	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Decontamination		
Water-only decontamination	Confirm PFAS-free water source via laboratory analysis prior to inspections	DER 2016
Alconox®, Liquinox® or Citranox® followed by deionized water or PFAS-free water rinse	Alconox® known to contain trace levels of 1,4-dioxane	NHDES 2016; USACE 2016; MassDEP 2017
Methanol, isopropanol, or acetone	Special health and safety precautions are necessary	UNEP 2015; USACE 2016
Clothing		
	Synthetic or cotton material, previously laundered clothing without the use of fabric softeners	MassDEP 2021

Note: This list is considered preliminary and additional materials may be added as additional information becomes available. Project teams are expected to follow a methodical evaluation process of materials to be used and confirm acceptance prior to implementation of field activities.

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Table 2: Summary of Equipment and Materials Not Recommended for PFAS Site Inspections

Sampling Materials	Known PFAS-Containing Materials	Suspected PFAS-Containing Materials	Materials with Potential to Retain PFASs	References
Water Sampling Materials				
Teflon® or polytetrafluoroethylene (PTFE)-containing or coated field equipment (e.g., tubing, bailers, tape, plumbing paste)	x			DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Passive diffusion bags			x	MassDEP 2017
LDPE HydraSleeves™			x	USACE 2016; MassDEP 2017
Water particle filters			x	MassDEP 2017
Drilling and Soil Sampling Materials				
Aluminum foil			x	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Drilling fluid containing PFASs	x	x		DER 2016
Sample Containers and Storage				
Gas Sample containers with lined lids			x	DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
LDPE containers and lined lids			x	USACE 2016
Teflon® or PTFE-lined lids on containers (e.g., sample containers, rinsate water storge containers)	x			DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Reuseable chemical or gel ice packs (e.g., BlueIce®)		x		DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Field Documentation				
Self-sticking notes and similar office products (e.g., 3M, Post-it®-notes)		x		DER 2016; USACE 2016; NHDES 2016; MassDEP 2017
Waterproof paper, notebooks, and labels	x			DER 2016, MassDEP 2017
Sharpie® markers	x			NHDES 2016
Decontamination				
Some detergents and decontamination solutions (e.g., Decon 90® Decontamination Solution)	x	x		DER 2016; NHDES 2016; MassDEP 2017
Clothing				
Synthetic water resistant and/or stain resistant			x	MassDEP 2021

clothing or boots				

Note: For materials that are suspected of containing PFASs, or have the potential to retain PFASs, project specific considerations may provide adequate justification for use during the field event. For example, further evaluation may be conducted in the form of pre-field equipment blank sample analysis.

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TGI - INVESTIGATION-DERIVED WASTE HANDLING AND STORAGE

Rev #: 1

Rev Date: May 15, 2020

VERSION CONTROL

Revision No	Revision Date	Page No(s)	Description	Reviewed by
0	February 23, 2017	ALL	Conversion from SOP to TGI	Ryan Mattson / Peter Frederick
1	May 15, 2020	ALL	Updated to reflect regulatory changes	

APPROVAL SIGNATURES

Prepared by:		02/23/2017
	Derrick Maurer	Date:
Technical Expert Reviewed by:		05/15/2020
	Ryan Mattson (Technical Expert)	Date:

1 INTRODUCTION

This document describes general and/or specific procedures, methods, actions, steps, and considerations to be used and observed by Arcadis staff when performing work, tasks, or actions under the scope and relevancy of this document. This document may describe expectations, requirements, guidance, recommendations, and/or instructions pertinent to the service, work task, or activity it covers.

It is the responsibility of the Arcadis Certified Project Manager (CPM) to provide this document to the persons conducting services that fall under the scope and purpose of this procedure, instruction, and/or guidance. The Arcadis CPM will also ensure that the persons conducting the work falling under this document are appropriately trained and familiar with its content. The persons conducting the work under this document are required to meet the minimum competency requirements outlined herein, and inquire to the CPM regarding any questions, misunderstanding, or discrepancy related to the work under this document.

This document is not considered to be all inclusive nor does it apply to any and all projects. It is the CPM's responsibility to determine the proper scope and personnel required for each project. There may be project- and/or client- and/or state-specific requirements that may be more or less stringent than what is described herein. The CPM is responsible for informing Arcadis and/or Subcontractor personnel of omissions and/or deviations from this document that may be required for the project. In turn, project staff are required to inform the CPM if or when there is a deviation or omission from work performed as compared to what is described herein.

In following this document to execute the scope of work for a project, it may be necessary for staff to make professional judgment decisions to meet the project's scope of work based upon site conditions, staffing expertise, state-specific requirements, health and safety concerns, etc. Staff are required to consult with the CPM when or if a deviation or omission from this document is required that has not already been previously approved by the CPM. Upon approval by the CPM, the staff can perform the deviation or omission as confirmed by the CPM.

2 SCOPE AND APPLICATION

The objective of this Technical Guidance Instruction (TGI) is to describe the procedures to manage investigation-derived wastes (IDW), both hazardous and nonhazardous, generated during site activities, which may include, but are not limited to: drilling, trenching/excavation, construction, demolition, monitoring well sampling, soil sampling, decontamination and remediation. For the purposes of this TGI, IDW is considered to be discarded materials which are defined as solid waste by United States Environmental Protection Agency (EPA) standard 40 CFR § 261.2 (which may include liquids, solids, or sludges). IDW may include soil, groundwater, drilling fluids, decontamination liquids, as well as contaminated personal protective equipment (PPE), sorbent materials, construction and demolition debris, and disposable sampling materials. Hazardous or uncharacterized IDW will be collected and staged at the point of generation. Quantities small enough to be containerized in 55-gallon drums will be taken to a designated temporary onsite storage area (discussed in further detail under Drum Storage) pending characterization and disposal. IDW materials will be characterized using process knowledge and appropriate laboratory analyses to determine the waste classification and evaluate proper safe handling and disposal methods.

This TGI describes the necessary equipment, field procedures, materials, regulatory references, and documentation procedures necessary for proper handling and storage of IDW up to the time it is properly transported from the project site and disposed. The procedures included in this TGI for handling and temporary storage of IDW are based on the EPA's guidance document *Guide to Management of Investigation Derived Wastes* (USEPA, 1992). IDW is assumed to be contaminated with the site constituents of concern (COCs) until analytical evidence indicates otherwise. IDW will be managed to ensure the protection of human health and the environment and will comply with all applicable or relevant and appropriate requirements (ARAR). Although not comprehensive, the following laws and regulations on Hazardous Waste Management should be considered as potential ARAR. It is the Arcadis Certified Project Manager (CPM) and/or designated Technical Expert to determine which laws and regulations, at all levels of government, are applicable to each project site and activity falling under this TGI.

Federal Laws and Regulations

- Resource Conservation and Recovery Act (RCRA) 42 USC § 6901-6987.
- Federal Hazardous Waste Regulations 40 CFR § 260-265

Department of Transportation (DOT) Hazardous Materials Transportation 49 CFR

Occupational Safety and Health Administration (OSHA) Regulations 29 CFR

State Laws and Regulations

- To be determined based on location of site and location of treatment, storage, and/or disposal facility (TSDF) to be utilized.

Regional, County, Municipal, and Local Regulations

- To be determined based on location of site and location of treatment, storage, and/or disposal facility (TSDF) to be utilized.

Initial Storage

Pending characterization, IDW will be temporarily stored appropriately within each area of contamination (AOC). Under RCRA, "storage" is defined as the "holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere" (40 CFR § 260.10). The onsite waste staging area will be in a secure and controlled area. Uncharacterized wastes are considered potentially hazardous wastes and must be stored in DOT approved packaging. Liquid wastes must be stored in DOT approved closed head drums or other approved containers (e.g., portable tank containers) that are compatible with the type of material stored therein. Solid materials must be stored in DOT approved open head drums where practicable. Larger quantities of solid IDW can be containerized in bulk containers (such as in a roll-off box). Soil from large excavation projects may be managed in stockpiles with within the AOC and does not need to be containerized until exiting the AOC.

Characterization

Waste characterization can either be based on generator knowledge, such as using historical process knowledge and safety data sheets (SDS), or can be based upon characterization sampling analytical results. IDW typically is not characterized using SDS as it is a mixture of aged chemicals and environmental media. Historical process knowledge should be used to determine if the IDW is a listed hazardous waste (40 CFR § 261.31-33). If the IDW is not a listed hazardous waste, waste characterization can be completed by laboratory analysis of representative samples of the IDW. The laboratory used for waste characterization analysis must have the appropriate state and federal accreditations and may be required to be pre-approved by the Client. IDW will be classified as RCRA hazardous or non-regulated under RCRA based on the waste characterization determination.

If IDW is characterized as RCRA hazardous waste, RCRA and DOT requirements must be followed for packaging, labeling, transporting, storing, and record keeping as described in 40 CFR § 262 and 49 CFR § 171-178. Waste material classified as RCRA nonhazardous may be handled and disposed of as nonhazardous waste in accordance with applicable federal, state, and local regulations.

Storage Time Limitations

Containerized hazardous wastes can be temporarily stored for a maximum of 90 calendar days from the accumulation start date for a large quantity generator or a maximum of 180 calendar days from the accumulation start date for a small quantity generator. Wastes classified as nonhazardous may be handled and disposed of as nonhazardous waste and are not subject to storage time limitations.

This is TGI may be modified by the CPM and/or Technical Expert for a specific project or client program, as required, dependent upon client requirements, site conditions, equipment limitations, or limitations imposed by the procedure. The resulting procedure employed to execute the work will be documented in the project work plans or reports. If changes to the sampling procedures are required due to unanticipated field conditions, the changes will be discussed with the CPM and/or Technical Expert as soon as practicable, and if approved to be performed, be documented.

3 PERSONNEL QUALIFICATIONS

Arcadis field sampling personnel will have current regulatory- and Arcadis-required health and safety training including 40-hour HAZWOPER training, site supervisor training, site-specific training, first aid, and cardiopulmonary resuscitation (CPR), as needed. Personnel handling and packaging hazardous waste and performing hazardous waste characterizations must have RCRA hazardous waste management training per 40 CFR § 264.16. Additional state-specific hazardous waste management training is required in certain states (i.e., California).

Although not common practice, in certain situations Arcadis personnel may sign waste profiles and/or waste manifests on a case by case basis for clients, provided the appropriate agreement is in place between Arcadis and the client documenting that Arcadis is not the generator, but is acting as an authorized representative of the generator. Arcadis personnel who sign waste profiles and/or waste manifests will have both current RCRA hazardous waste management training per 40 CFR § 264.16 and current DOT hazardous materials transportation training per 49 CFR § 172.704. Arcadis field personnel will also comply with client-specific training. In addition, Arcadis field sampling personnel will be knowledgeable in the relevant processes, procedures, and Technical Guidance Instructions (TGIs) and possess the demonstrated required skills and experience necessary to successfully complete the desired field work. The project health and safety plan (HASP) and other documents will identify other training requirements or access control requirements.

4 EQUIPMENT LIST

The Following Materials, as required, will be available for IDW handling and Storage:

- Appropriate personal protective equipment as specified in the Site Health and Safety Plan (HASP)
- DOT approved containers
- Hammer
- Leather gloves
- Drum dolly
- Appropriate drum labels (outdoor waterproof self-adhesive)
- Portable tank container
- Appropriate labeling, packing, chain-of-custody forms, and shipping materials as determined by the CPM and/or Technical Expert.
- Indelible ink and/or permanent marking pens
- Plastic sheeting
- Appropriate sample containers, labels, and forms
- Stainless-steel bucket auger
- Stainless steel spatula or knife
- Stainless steel hand spade
- Stainless steel scoop
- Digital camera
- Field logbook

5 CAUTIONS

Filled drums can be very heavy, become unbalanced, or spill its contents. Therefore, use appropriate moving techniques and equipment for safe handling. Similar media (e.g. soils with other soils; or liquids with other liquids) will be stored in the same drums to aid in sample analysis and disposal. Drum lids must be secured to prevent rainwater from entering the drums and leakage during movement. Drums containing solid material may not contain any free liquids. Waste containers stored for extended periods of time may be subject to deterioration. Drum Over Packs may be used as secondary containment. All drums must be visually inspected for condition to ensure that they are in good condition without visible evidence of rusting, holes, breakage, etc., to prevent potential leakage and facilitate subsequent disposal. All drum lids must be verified as having a properly functioning secured lid prior to use.

6 HEALTH AND SAFETY CONSIDERATIONS

As determined by the site's known and suspected hazards, appropriate PPE must be worn by all field personnel within the designated work area. Exposure air monitoring may be required during certain field activities as required in the Site Health and Safety Plan. If soil excavation in areas with potentially hazardous contaminants is possible, contingency plans will be developed to address the potential for encountering gross contamination or non-aqueous phase liquids. All excavation activities shall be in compliance with OSHA standard 29 CFR 1926.651 Excavations, and any other applicable regulations.

Arcadis field personnel and subcontractors will be trained in and perform their work in compliance with all applicable federal, state, and local health and safety regulations as well as Arcadis' HASP and applicable Client health and safety requirements.

7 PROCEDURE

Specific waste temporary storage and handling procedures to be used are dependent upon the type of generated waste, including type of media (e.g. soils or free liquids) and constituents of concern. For this reason, IDW can be stored in a secure location onsite in separate 55-gallon storage drums, where solids can be stockpiled onsite (if nonhazardous) and purge water may be stored in portable tank containers. Waste materials such as broken sample bottles or equipment containers and wrappings will be stored in 55-gallon drums unless they were not in contact with sample media.

Management of IDW

Minimization of IDW should be considered by the project team during all phases of the project. Site managers may want to consider techniques such as replacing solvent based cleaners with aqueous-based cleaners for decontamination of equipment, reuse of equipment (where it can be properly decontaminated), limitation of traffic between exclusion and support zones, and drilling methods and sampling techniques that minimize the generation of waste. Alternative drilling and subsurface sampling methods may include the use of small diameter boreholes, as well as borehole testing methods such as a core penetrometer or direct push technique instead of coring.

Drum Storage

Drums containing hazardous waste will be stored in accordance with the requirements of 40 CFR 265 Subpart I (for containers) and 265 Subpart DD (for containment buildings). All 55-gallon drums will be stored at a secure, centralized onsite location that is readily accessible for vehicular pick-up. Drums confirmed as, or assumed to contain hazardous waste will be stored over an impervious surface provided with secondary spill containment. The storage location will, for drums containing liquid, have a containment system that can contain at least the larger of 10% of the aggregate volume of staged materials or 100% of the volume of the largest container. Drums will be closed during storage and be in good condition in accordance with the Guide to Management of Investigation-Derived Wastes (USEPA, 1992).

Hazardous Waste Determination

Waste material must be characterized to determine if it meets any of the federal definitions of hazardous waste as required by 40 CFR § 262.11. If the waste does not meet any of the federal definitions, it must then be established if any state-specific or local-specific hazardous waste criteria exist/apply.

Generator Status

Once hazardous waste determination has been made, the generator status will be determined. Large quantity generators (LQG) are generators who generate more than 1,000 kilograms of hazardous waste in a calendar month. Small quantity generators (SQG) of hazardous waste are generators who generate greater than 100 kilograms but less than 1,000 kilograms of hazardous waste in a calendar month. Very small quantity generators (VSQG) are generators who generate less than 100 kilograms of hazardous waste per month. Please note that a generator status may change from month to month and that a notice of this change is usually required by the generator's state agency.

Accumulation Time for Hazardous Waste

A LQG may accumulate hazardous waste on site for 90 calendar days or less without a permit and without having interim status, provided that such accumulation is in compliance with requirements in 40 CFR § 262.17. A SQG may accumulate hazardous waste on site for 180 calendar days or less without a permit or without having interim status, subject to the requirements of 40 CFR § 262.16. VSQG requirements are found in 40 CFR § 262.14. NOTE: The federal VSQG and SQG provisions may not be recognized by some states (e.g., California and Rhode Island). State-specific and local-specific regulations must be reviewed and understood prior to the generation of hazardous waste.

Satellite Accumulation of Hazardous Waste Satellite accumulation (SAA) will mean the accumulation of as much as fifty-five (55) gallons of hazardous waste, or the accumulation of as much as one quart of acutely hazardous waste, in containers at or near any point of generation where the waste initially accumulates, which is under the control of the operator of the process generating the waste, without a permit or interim status and without complying with the requirements of 40 CFR § 262.15 and without any storage time limit, provided that the generator complies with 40 CFR § 262.15.

Once more than 55 gallons of hazardous waste accumulates in SAA, the generator has three days to move this waste into storage.

Storage recommendations for hazardous waste include:

- Ignitable or reactive hazardous wastes must be >50 feet from the property line per 40 CFR § 265.176 (LQG generators only).
- Hazardous waste should be stored on a concrete slab (asphalt is acceptable if there are no free liquids in the waste).
- Drainage must be directed away from the accumulation area.
- Area must be properly vented.
- Area must be secure.

Drum/Container Labeling

Drums will be labeled on both the side and lid of the drum using a permanent marking pen. Old drum labels must be removed to the extent possible, descriptions crossed out should any information remain, and new labels affixed on top of the old labels. Other containers used to store various types of waste (e.g., polyethylene tanks, roll-off boxes, end-dump trailers, etc.) will be labeled with an appropriate "Waste Container" or "Testing in Progress" label pending characterization. Drums and containers will be labeled as follows:

- Appropriate waste characterization label (Pending Analysis, Hazardous, or Nonhazardous)
- Waste generator's name (e.g., client name)
- Project Name
- Name and telephone number of Arcadis project manager
- Composition of contents (e.g., used oil, acetone 40%, toluene 60%)
- Media (e.g., solid, liquid)
- Accumulation start date

- Drum number of total drums as reconciled with the Drum Inventory maintained in the field log book.

IDW containers will remain closed except when adding or removing waste. Immediately upon beginning to place waste into the drum/container, a “Waste Container” or “Pending Analysis” label will be filled out to include the information specified above, and affixed to the container. Once the contents of the container are identified as either non-hazardous or hazardous, the following additional labels will be applied.

- Containers with waste determined to be non-hazardous will be labeled with a green and white "Nonhazardous Waste" label over the "Waste Container" label.
- Containers with waste determined to be hazardous will be stored in an onsite storage area and will be labeled with the "Hazardous Waste" label and affixed over the "Waste Container" label.

The ACCUMULATION DATE for the hazardous waste is the date the waste is first placed in the container and is the same date as the date on the "Waste Container" label. DOT hazardous class labels must be applied to all hazardous waste containers for shipment offsite to an approved disposal or recycling facility. In addition, a DOT proper shipping name will be included on the hazardous waste label. The transporter should be equipped with the appropriate DOT placards. However, placarding or offering placards to the initial transporter is the responsibility of the generator per 40 CFR § 262.33.

Inspections and Documentation

All IDW will be documented as generated on a Drum Inventory Log maintained in the field log book. The Drum Inventory will record the generation date, type, quantity, matrix and origin (e.g., Boring-1, Test Pit 3, etc.) of materials in every drum, as well as a unique identification number for each drum. The drum inventory will be used during drum pickup to assist with labeling of drums. The drum storage area and any other areas of temporarily staged waste, such as soil/debris piles, will be inspected weekly. The weekly inspections will be recorded in the field notebook or on a Weekly Inspection Log. Digital photographs will be taken upon the initial generation and drumming/staging of waste, and final labeling after characterization to document compliance with labeling and storage protocols, and condition of the container. Evidence of damage, tampering or other discrepancy should be documented photographically.

Emergency Response and Notifications

Specific procedures for responding to site emergencies will be detailed in the HASP. If the generator is designated as a LQG, a Contingency Plan will need to be prepared to include emergency response and notification procedures per 40 CFR § 265 Subpart D. In the event of a fire, explosion, or other release which could threaten human health outside of the site or when Client or Arcadis has knowledge of a spill that has reached surface water, Client or Arcadis must immediately notify the National Response Center (800-424-8802) in accordance with 40 CFR § 262.265. Other notifications to state and/or other local regulatory agencies may also be necessary.

Drilling Soil Cuttings and Muds

Soil cuttings are solid to semi-solid soils generated during trenching activities, subsurface soil sampling, or installation of monitoring wells. Depending on the drilling method, drilling fluids known as "muds" may be used to remove soil cuttings. Drilling fluids flushed from the borehole must be directed into a settling section of a mud pit. This allows reuse of the decanted fluids after removal of the settled sediments. Soil cuttings will be labeled and stored in 55-gallon drums with bolt-sealed lids.

Excavated Solids

Excavated solids may include, but are not limited to: soil, fill, and construction and demolition debris. Prior to permitted treatment or offsite disposal, potentially hazardous excavated solids may be temporarily stockpiled onsite as long as the stockpile remains in the same AOC from where it was excavated. Potentially hazardous excavated solids removed from the AOC must be immediately containerized in labeled drums or closable top roll-offs lined with 9-mil polyvinyl chloride (PVC) sheeting and are subject to LQG storage time limits. Nonhazardous excavated solids can be stockpiled either inside or outside of the AOC, do not have to be containerized and are not subject to hazardous waste regulations. Potentially hazardous excavated solids must not be mixed with nonhazardous excavated solids. All classes of excavated solid stockpiles should be maintained in a secure area onsite. At a minimum, the floor of the stockpile area will be covered with a 20-mil high density polyethylene liner that is supported by a foundation or at least a 60-mil high density polyethylene liner that is not supported by a foundation. The excavated material will not contain free liquids. The owner/operator will provide controls for windblown dispersion, run-on control, and precipitation runoff. The run-on control system will prevent flow onto the active portion of the pile during peak discharge from at least a 25-year storm and the run-off management system will collect and control at least the water volume resulting from a 24-hour, 25-year storm (USEPA, 1992). Additionally, the stockpile area will be inspected on a weekly basis and after storm events. Individual states may require that the stockpile be inspected/certified by a licensed professional engineer. Stockpiled material will be covered with a 6-mil polyvinyl chloride (PVC) liner or sprayed dust control product. The stockpile cover will be secured in place with appropriate material (concrete blocks, weights, etc.) to prevent the movement of the cover.

Decontamination Solutions

Decontamination solutions are generated during the decontamination of personal protective equipment and sampling equipment. Decontamination solutions may range from detergents, organic solvents and acids used to decontaminate small field sampling equipment to steam cleaning rinsate used to wash heavy field equipment. These solutions are to be labeled and stored in closed head drums compatible with the decontamination solution. Decontamination procedures, including personnel and field sampling equipment, must comply with applicable Arcadis procedural documents.

Disposable Equipment

Disposable equipment includes personal protective equipment (e.g., tyvek coveralls, gloves, booties and APR cartridges) and disposable sampling equipment such as trowels or disposable bailers. If the media sampled exhibits hazardous characteristics per results of waste characterization sampling, contaminated disposable equipment will also be disposed of as a hazardous waste. If compatible with the original IDW waste stream (i.e., the IDW is a solid and the disposal equipment is a solid), the disposable equipment can be combined with the IDW. If these materials are not compatible (i.e., the IDW is a liquid and the disposal equipment is a solid), the disposable equipment will be stored onsite in separate labeled 55-gallon drums. Uncontaminated or decontaminated disposable equipment can be considered nonhazardous waste.

Purge Water

Purge water includes groundwater generated during well development, groundwater sampling, or aquifer testing. The volume of groundwater generated will dictate the appropriate storage procedure. Monitoring well development and groundwater sampling may generate three well volumes of groundwater or more. This volume will be stored in labeled 55-gallon drums. Aquifer tests may generate significantly greater volumes of groundwater depending on the well yield and the duration of the test. Therefore, large-volume portable polyethylene tanks will be considered for temporary storage pending groundwater-waste characterization.

Purged Water Storage Tank Decontamination and Removal

The following procedures will be used for inspection, cleaning, and offsite removal of storage tanks used for temporary storage of purge water. These procedures are intended to be used for rented portable tanks such as Baker Tanks or Rain for Rent containers. Storage tanks will be made of inert plastic materials. The major steps for preparing a rented tank for return to a vendor include characterizing the purge water, disposing of the purge water, decontaminating the tank, final tank inspection, and mobilization. Decontamination and inspection procedures are described in further detail below.

- <u>Tank Cleaning</u>: Most vendors require that tanks be free of any visible sediment and water before returning, a professional cleaning service may be required. Each specific vendor should be consulted concerning specific requirements for returning tanks.
- <u>Tank Inspection</u>: After emptying the tank, purged water storage tanks should be inspected for debris, chemical staining, and physical damage. The vendors require that tanks be returned in the original condition (i.e., free of sediment, staining and no physical damage).

8 WASTE MANAGEMENT

Soil/Solids Characterization

Waste characterization will be conducted in accordance with waste hauler, waste handling facility, and local/state/federal requirements. In general, RCRA hazardous wastes are those solid wastes determined by a Toxicity Characteristic Leaching Procedure (TCLP) test or to contain levels of certain toxic metals, pesticides, or other organic chemicals above specific applicable regulatory agency thresholds. If the one or more of 40 toxic compounds listed in Table I of 40 CFR § 261.24 are detected in the sample at levels above the maximum unregulated concentrations, the waste must be characterized as a toxic hazardous waste. Wastes can also be considered “listed” hazardous waste depending on site-specific processes.

Composite soil samples will be collected at a frequency of one sample per 250 cubic yard basis for stockpiled soil or one per 55-gallon drum per different waste stream for containerized. A four-point composite sample will be collected per 250 cubic yards of stockpiled material and for each drum waste stream. Sample and composite frequencies may be adjusted in accordance with the waste handling facility’s requirements and may be reduced for large volumes of waste with consistent properties. Waste characterization samples will be considered valid for consistent waste streams for a period of 1 year. Waste characterization samples may be analyzed for the TCLP volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP RCRA metals, and polychlorinated biphenyls (PCBs), as well as reactivity and flammability (flashpoint). Additional samples may be collected and analyzed by the laboratory on a contingency basis. Site-specific constituents of concern including pesticides may require additional sampling. Please note that state- or local-specific regulations may require a different or additional sampling approaches.

Wastewater Characterization

Waste characterization will be conducted in accordance with the requirements of the waste hauler, waste handling facility, and local/state/federal governments. In general, purge water should be analyzed by methods appropriate for the known contaminants, if any, that have been historically detected in the monitoring wells. Samples will be collected and analyzed in accordance with the requirements of the waste disposal facility. Wastewater characterization samples may be analyzed for TCLP volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP RCRA metals, and polychlorinated biphenyls, as well as corrosivity (pH), reactivity and flammability (flashpoint). Additional samples may be collected and analyzed by the laboratory on a contingency basis. Site-specific constituents of concern including pesticides may require additional sampling. Please note that state- and/or local-specific regulations may require different or additional sampling approaches.

Sample Handling and Shipping

All samples will be appropriately labeled, packed, and shipped, and the chain-of-custody will be filled out in accordance with current Arcadis sample chain of custody, handling, packing, and shipping procedures and guidance instructions.

It should be noted that additional training is required for packaging and shipping of hazardous and/or dangerous materials. Please refer to the current Arcadis training requirements related to handling and shipping of samples, shipping determinations, and hazardous materials.

Preparing Waste Shipment Documentation (Hazardous and Nonhazardous)

Waste profiles will be prepared by the Arcadis CPM and forwarded, along with laboratory analytical data to the Client for approval/signature. The Client will then return the profile to Arcadis who will then forward to the waste removal contractor for preparation of a manifest. The manifest will be reviewed by Arcadis prior to forwarding to the Client for approval. Upon approval of the manifest, the Client will return the original signed manifest directly to the waste contractor or to the Arcadis CPM for forwarding to the waste contractor. Arcadis personnel may sign waste profiles and/or waste manifests on a case by case basis for clients, provided the appropriate agreement is in place between Arcadis and the client documenting that Arcadis is not the generator, but is acting as an authorized representative of the generator.

Final drum labeling and pickup will be supervised by an Arcadis representative who is trained and experienced with applicable waste labeling procedures. The Arcadis representative will have a copy of the drum inventory maintained in the field book and will reconcile the drum inventory with the profile numbers on the labels and on the manifest. Different profile numbers will be generated for different matrices or materials in the drums. For example, the profile number for drill cuttings will be different than the profile number for purge water. When there are multiple profiles it is critical that the proper label, with the profile number appropriate to a specific material be affixed to the proper drums. A copy of the Arcadis drum inventory will be provided to the waste transporter during drum pickup and to the facility receiving the waste.

9 DATA RECORDING AND MANAGEMENT

Waste characterization sample handling, packing, and shipping procedures will be documented in accordance with relevant Arcadis procedures and guidance instructions as well as applicable client and/or project requirements, such as a Quality Assurance Project Plan or Sampling and Analysis Plan. Copies of the chain-of-custody forms will be maintained in the project file. Arcadis should photograph or maintain a copy of any hazardous waste manifest signed on behalf of Client in the corresponding office DOT record file.

10 QUALITY ASSURANCE

The CPM or APM will review all field documentation once per week for errors or omissions as compared to applicable project requirements including but not limited to: the proposal/scope of work, QAPP, SAP, HASP, etc. Deficiencies will be noted, tracked, and resolved. Upon correction, they will be noted for project documentation.

11 REFERENCES

United States Environmental Protection Agency (USEPA). 1992. Guide to Management of Investigation-Derived Wastes. Office of Remedial and Emergency Response. Hazardous Site Control Division. January 1992.

Appendix B

Eurofins and SGS AXYS Laboratory Certifications and Procedures

Wisconsin Scope of Accreditation

Laboratory FID: 999580010
CERTIFICATION
Aqueous (Non-potable Water)

Eurofins Chicago
2417 Bond Street
University Park, IL 60484

Printed on: 8/8/2024
Expires on: 8/31/2025

Oxygen Demand Assays (BOD or cBOD)	**Biochemical Oxygen Demand (BOD)**
	Carbonaceous Biochemical Oxygen Demand (cBOD)
Colorimetric or Turbidimetric	**Ammonia as N**
	Chloride
	Chromium, Hexavalent
	Cyanide, Available
	Cyanide, Total
	Kjeldahl Nitrogen, Total
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Orthophosphate
	Phenolics, Total
	Phosphorus, Total
	Sulfate
Nondispersive Infrared (NDIR) or Microcoulometry	**Organic Carbon, Total (TOC)**
Electrometric Assays (ISE)	**Fluoride**
	Oxygen, Dissolved
	pH
	Specific Conductance
Gravimetric Assays - Residue (solids)	**Residue, Filterable (TDS)**

Gravimetric Assays - Residue (solids)	**Residue, Nonfilterable (TSS)**
	Residue, Settleable
	Residue, Total (Total Solids)
	Residue, Volatile (TVS)
	Residue, Volatile, Nonfilterable (TVSS)
Extraction/Gravimetric Assays - Oil & Grease as HEM	**Oil & Grease as HEM**
	Oil & Grease as HEM, Silica Gel Treated (SGT)
Ion Chromatography (IC)	**Bromide**
	Chloride
	Chromium, Hexavalent
	Fluoride
	Nitrate
	Nitrite
	Orthophosphate
	Sulfate
Titrimetric or Potentiometric Titration Assays	**Alkalinity**
	Chemical Oxygen Demand (COD)
	Chlorine, Total Residual (TRC)
	Sulfide
	Sulfides, Acid-Soluble and Acid-Insoluble
Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Aluminum**

Wisconsin Scope of Accreditation

Laboratory FID: 999580010
CERTIFICATION
Aqueous (Non-potable Water)

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Antimony**
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Hardness, Total as CaCO3
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silica
	Silver
	Sodium

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Strontium**
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum

Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Nickel**
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
	## PESTICIDES, ORGANOCHLORINE (group)
	2,4,5-T
	2,4-D
	2,4-DB
	Dalapon
	Dicamba
	Dichlorprop (2,4-DP)
	Diesel Range Organics (DRO)
	Dinoseb (2-sec-butyl-4,6-Dinitrophenol)
	Gasoline Range Organics (GRO)

Gas Chromatography (GC)	**Pentachlorophenol**
	Picloram
	Silvex (2,4,5-TP)
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## VOC - VOLATILE ORGANICS (group)
	Diallate (cis and trans)
	Kepone
	Pentachloronitrobenzene (PCNB)
	Pronamide

Wisconsin Scope of Accreditation

Laboratory FID: 999580010
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Eurofins Chicago
2417 Bond Street
University Park, IL 60484

Printed on: **8/8/2024**
Expires on: **8/31/2025**

Colorimetric or Turbidimetric	**Ammonia as N**
	Chloride
	Chromium, Hexavalent
	Cyanide, Available
	Cyanide, Total
	Kjeldahl Nitrogen, Total
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Orthophosphate
	Phenolics, Total
	Phosphorus, Total
	Sulfate
Nondispersive Infrared (NDIR) or Microcoulometry	**Organic Carbon, Total (TOC)**
Electrometric Assays (ISE)	**Fluoride**
	pH
	Specific Conductance
Gravimetric Assays - Residue (solids)	**Residue, Total**
	Residue, Volatile (TVS)
Ion Chromatography (IC)	**Bromide**
	Chloride

Ion Chromatography (IC)	**Fluoride**
	Nitrate
	Nitrite
	Orthophosphate
	Sulfate
Titrimetric or Potentiometric Titration Assays	**Chemical Oxygen Demand (COD)**
	Sulfide
	Sulfides, Acid-Soluble and Acid-Insoluble
Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Magnesium**
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium

Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Chromium, Total**
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
	## PESTICIDES, ORGANOCHLORINE (group)
	2,4,5-T

Wisconsin Scope of Accreditation

Laboratory FID: 999580010
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Gas Chromatography (GC)	**2,4-D**
	2,4-DB
	Dalapon
	Dicamba
	Dichlorprop (2,4-DP)
	Diesel Range Organics (DRO)
	Dinoseb (2-sec-butyl-4,6-Dinitrophenol)
	Gasoline Range Organics (GRO)
	Pentachlorophenol
	Picloram
	Silvex (2,4,5-TP)
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## VOC - VOLATILE ORGANICS (group)
	Diallate (cis and trans)
Solid Waste Leaching Procedures	**Reagent Water Shake Extraction (ASTM Leach)**
	SPLP Extraction
Hazardous Waste Characteristics	**Corrosivity, Liquids**
	Ignitability (Flashpoint), Pensky-Martens Closed Cup
	Paint Filter Liquids Test
	TCLP Extraction

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

The State of Wisconsin
Department of Natural Resources

has granted

Accreditation under NR 149

to

Eurofins Chicago

FID: 399172840

The laboratory is accredited to perform environmental sample analysis in support of covered environmental programs per matrix for the combination of analyte and technology or analyte and method as specified in the attached Scopes of Accreditation.

Printed on: **March 12, 2025**

Expires on: **August 31, 2025**

Zana Sijan

Zana Sijan, Manager
Certification Services

This certificate does not guarantee validity of data generated, but indicates the methodology, equipment, quality control practices, records, and proficiency of the laboratory have been reviewed and found to satisfy the requirements of chapter NR 149, Wisconsin Administrative Code.

Wisconsin Scope of Accreditation

Laboratory FID: 399172840
CERTIFICATION
Aqueous (Non-potable Water)

Eurofins Chicago
18410 Crossing Drive, Suite E
Tinley Park, IL 60487

Printed on: **3/12/2025**
Expires on: **8/31/2025**

Oxygen Demand Assays (BOD or cBOD)	**Biochemical Oxygen Demand (BOD)**
	Carbonaceous Biochemical Oxygen Demand (cBOD)
Colorimetric or Turbidimetric	**Ammonia as N**
	Chloride
	Chromium, Hexavalent
	Cyanide, Available
	Cyanide, Total
	Kjeldahl Nitrogen, Total
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Orthophosphate
	Phenolics, Total
	Phosphorus, Total
	Sulfate
Nondispersive Infrared (NDIR) or Microcoulometry	**Organic Carbon, Total (TOC)**
Electrometric Assays (ISE)	**Fluoride**
	Oxygen, Dissolved
	pH
	Specific Conductance
Gravimetric Assays - Residue (solids)	**Residue, Filterable (TDS)**

Wisconsin Scope of Accreditation

Laboratory FID: 399172840
CERTIFICATION
Aqueous (Non-potable Water)

Gravimetric Assays - Residue (solids)	**Residue, Nonfilterable (TSS)**
	Residue, Settleable
	Residue, Total (Total Solids)
	Residue, Volatile (TVS)
	Residue, Volatile, Nonfilterable (TVSS)
Extraction/Gravimetric Assays - Oil & Grease as HEM	**Oil & Grease as HEM**
	Oil & Grease as HEM, Silica Gel Treated (SGT)
Ion Chromatography (IC)	**Bromide**
	Chloride
	Chromium, Hexavalent
	Fluoride
	Nitrate
	Nitrite
	Orthophosphate
	Sulfate
Titrimetric or Potentiometric Titration Assays	**Alkalinity**
	Chemical Oxygen Demand (COD)
	Chlorine, Total Residual (TRC)
	Sulfide
	Sulfides, Acid-Soluble and Acid-Insoluble
Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Aluminum**

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Antimony**
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Hardness, Total as CaCO3
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silica
	Silver
	Sodium

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Strontium**
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum

Wisconsin Scope of Accreditation

Laboratory FID: 399172840
CERTIFICATION
Aqueous (Non-potable Water)

Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Nickel**
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
	## PESTICIDES, ORGANOCHLORINE (group)
	2,4,5-T
	2,4-D
	2,4-DB
	Dalapon
	Dicamba
	Dichlorprop (2,4-DP)
	Diesel Range Organics (DRO)
	Dinoseb (2-sec-butyl-4,6-Dinitrophenol)
	Gasoline Range Organics (GRO)

Gas Chromatography (GC)	**Pentachlorophenol**
	Picloram
	Silvex (2,4,5-TP)
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## VOC - VOLATILE ORGANICS (group)
	Diallate (cis and trans)
	Kepone
	Pentachloronitrobenzene (PCNB)
	Pronamide

Wisconsin Scope of Accreditation

Laboratory FID: 399172840
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Eurofins Chicago
18410 Crossing Drive, Suite E
Tinley Park, IL 60487

Printed on: **3/12/2025**
Expires on: **8/31/2025**

Colorimetric or Turbidimetric	**Ammonia as N**
	Chloride
	Chromium, Hexavalent
	Cyanide, Available
	Cyanide, Total
	Kjeldahl Nitrogen, Total
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Orthophosphate
	Phenolics, Total
	Phosphorus, Total
	Sulfate
Nondispersive Infrared (NDIR) or Microcoulometry	**Organic Carbon, Total (TOC)**
Electrometric Assays (ISE)	**Fluoride**
	pH
	Specific Conductance
Gravimetric Assays - Residue (solids)	**Residue, Total**
	Residue, Volatile (TVS)
Ion Chromatography (IC)	**Bromide**
	Chloride

Ion Chromatography (IC)	**Fluoride**
	Nitrate
	Nitrite
	Orthophosphate
	Sulfate
Titrimetric or Potentiometric Titration Assays	**Chemical Oxygen Demand (COD)**
	Sulfide
	Sulfides, Acid-Soluble and Acid-Insoluble
Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead

Wisconsin Scope of Accreditation

Laboratory FID: 399172840
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Magnesium**
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Cadmium
	Calcium

Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Chromium, Total**
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Titanium
	Vanadium
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
	## PESTICIDES, ORGANOCHLORINE (group)
	2,4,5-T

Gas Chromatography (GC)	**2,4-D**
	2,4-DB
	Dalapon
	Dicamba
	Dichlorprop (2,4-DP)
	Diesel Range Organics (DRO)
	Dinoseb (2-sec-butyl-4,6-Dinitrophenol)
	Gasoline Range Organics (GRO)
	Pentachlorophenol
	Picloram
	Silvex (2,4,5-TP)
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## VOC - VOLATILE ORGANICS (group)
	Diallate (cis and trans)
Solid Waste Leaching Procedures	**Reagent Water Shake Extraction (ASTM Leach)**
	SPLP Extraction
Hazardous Waste Characteristics	**Corrosivity, Liquids**
	Ignitability (Flashpoint), Pensky-Martens Closed Cup
	Paint Filter Liquids Test
	TCLP Extraction

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY
NELAP - RECOGNIZED

ENVIRONMENTAL LABORATORY ACCREDITATION

is hereby granted to

Eurofins Chicago
2417 Bond Street
University Park, IL 60484

NELAP ACCREDITED

Accreditation Number #100201

According to the Illinois Administrative Code, Title 35, Subtitle A, Chapter II, Part 186, ACCREDITATION OF LABORATORIES FOR DRINKING WATER, WASTEWATER AND HAZARDOUS WASTES ANALYSIS, the State of Illinois formally recognizes that this laboratory is technically competent to perform the environmental analyses listed on the scope of accreditation detailed below.

The laboratory agrees to perform all analyses listed on this scope of accreditation according to the Part 186 requirements and acknowledges that continued accreditation is dependent on successful ongoing compliance with the applicable requirements of Part 186. Please contact the Illinois EPA Environmental Laboratory Accreditation Program (IL ELAP) to verify the laboratory's scope of accreditation and accreditation status. Accreditation by the State of Illinois is not an endorsement or a guarantee of validity of the data generated by the laboratory.

Primary Accrediting Authority:Illinois

Millie Rose

Millie Rose
Supervisor
Environmental Laboratory Accreditation Program

Certificate No: 1002012024-19
Expiration Date: 5/31/2025
Issued On: 5/7/2024

State of Illinois
Environmental Protection Agency
Awards the Certificate of Approval to:

Eurofins Chicago
2417 Bond Street
University Park, IL 60484

The Illinois Environmental Laboratory Accreditation Program encourages all clients and data users to verify the most current scope of accreditation for Eurofins Chicago.

Certificate No.: 1002012024-19 **Primary AB**

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Method EPA 120.1	
Conductivity	IL
Method EPA 160.4	
Residue-volatile	IL
Method EPA 1664A Rev: 1	
Oil & Grease	IL
Method EPA 1664A (SGT-HEM)	
Oil & Grease	IL
Method EPA 1664B	
Oil & Grease	IL
Method EPA 1664B (SGT-HEM)	
Oil & Grease	IL
Method EPA 180.1 Rev: 2	
Turbidity	IL
Method EPA 200.7 Rev: 4.4	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Thallium	IL

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL
Method EPA 200.8 Rev: 5.4	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silver	IL
Sodium	IL
Thallium	IL
Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL
Method EPA 218.6 Rev: 3.3	
Chromium VI	IL
Method EPA 245.1 Rev: 3	
Mercury	IL
Method EPA 300.0 Rev: 2.1	
Bromide	IL
Chloride	IL
Fluoride	IL
Nitrate	IL
Nitrate plus Nitrite as N	IL
Nitrite	IL
Orthophosphate as P	IL
Sulfate	IL
Method EPA 335.4 Rev: 1	
Cyanide	IL
Method EPA 350.1 Rev: 2	
Ammonia as N	IL
Method EPA 351.1	
Total Kjeldahl Nitrogen (TKN)	IL

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Method EPA 351.2 Rev: 2

Total Kjeldahl Nitrogen (TKN)	IL

Method EPA 353.2 Rev: 2

Nitrate	IL
Nitrate-nitrite	IL

Method EPA 365.1 Rev: 2

Orthophosphate as P	IL
Phosphorus	IL

Method EPA 420.4 Rev: 1

Total phenolics	IL

Method EPA 608.3 GC-ECD

4,4'-DDD	IL
4,4'-DDE	IL
4,4'-DDT	IL
Aldrin	IL
alpha-BHC (alpha-Hexachlorocyclohexane)	IL
Aroclor-1016 (PCB-1016)	IL
Aroclor-1221 (PCB-1221)	IL
Aroclor-1232 (PCB-1232)	IL
Aroclor-1242 (PCB-1242)	IL
Aroclor-1248 (PCB-1248)	IL
Aroclor-1254 (PCB-1254)	IL
Aroclor-1260 (PCB-1260)	IL
beta-BHC (beta-Hexachlorocyclohexane)	IL
Chlordane (tech.)(N.O.S.)	IL
delta-BHC	IL
Dieldrin	IL
Endosulfan I	IL
Endosulfan II	IL
Endosulfan sulfate	IL
Endrin	IL
Endrin aldehyde	IL
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	IL
Heptachlor	IL
Heptachlor epoxide	IL
Methoxychlor	IL
Toxaphene (Chlorinated camphene)	IL

Method EPA 624.1

1,1,1-Trichloroethane	IL
1,1,2,2-Tetrachloroethane	IL
1,1,2-Trichloroethane	IL
1,1-Dichloroethane	IL
1,1-Dichloroethylene	IL
1,2-Dichlorobenzene (o-Dichlorobenzene)	IL
1,2-Dichloroethane (Ethylene dichloride)	IL
1,2-Dichloropropane	IL
1,3-Dichlorobenzene	IL
1,4-Dichlorobenzene	IL
2-Chloroethyl vinyl ether	IL
Acrolein (Propenal)	IL

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Acrylonitrile	IL
Benzene	IL
Bromodichloromethane	IL
Bromoform	IL
Carbon tetrachloride	IL
Chlorobenzene	IL
Chlorodibromomethane	IL
Chloroethane (Ethyl chloride)	IL
Chloroform	IL
cis-1,3-Dichloropropene	IL
Ethylbenzene	IL
Methyl bromide (Bromomethane)	IL
Methyl chloride (Chloromethane)	IL
Methyl tert-butyl ether (MTBE)	IL
Methylene chloride (Dichloromethane)	IL
Tetrachloroethylene (Perchloroethylene)	IL
Toluene	IL
trans-1,2-Dichloroethylene	IL
trans-1,3-Dichloropropylene	IL
Trichloroethene (Trichloroethylene)	IL
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	IL
Vinyl chloride	IL
Xylene (total)	IL

Method EPA 625.1

1,2,4-Trichlorobenzene	IL
1,2-Dichlorobenzene (o-Dichlorobenzene)	IL
1,2-Diphenylhydrazine	IL
1,3-Dichlorobenzene	IL
1,4-Dichlorobenzene	IL
2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether	IL
2,4,5-Trichlorophenol	IL
2,4,6-Trichlorophenol	IL
2,4-Dichlorophenol	IL
2,4-Dimethylphenol	IL
2,4-Dinitrophenol	IL
2,4-Dinitrotoluene (2,4-DNT)	IL
2,6-Dinitrotoluene (2,6-DNT)	IL
2-Chloronaphthalene	IL
2-Chlorophenol	IL
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	IL
2-Nitrophenol	IL
3,3'-Dichlorobenzidine	IL
4-Bromophenyl phenyl ether	IL
4-Chloro-3-methylphenol	IL
4-Chlorophenyl phenylether	IL
4-Nitrophenol	IL
Acenaphthene	IL
Acenaphthylene	IL
Anthracene	IL
Benzidine	IL
Benzo(a)anthracene	IL
Benzo(a)pyrene	IL

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Benzo(b)fluoranthene	IL
Benzo(g,h,i)perylene	IL
Benzo(k)fluoranthene	IL
bis(2-Chloroethoxy)methane	IL
bis(2-Chloroethyl) ether	IL
bis(2-Ethylhexyl) phthalate (DEHP)	IL
Butyl benzyl phthalate	IL
Chrysene	IL
Dibenz(a,h) anthracene	IL
Diethyl phthalate	IL
Dimethyl phthalate	IL
Di-n-butyl phthalate	IL
Di-n-octyl phthalate	IL
Fluoranthene	IL
Fluorene	IL
Hexachlorobenzene	IL
Hexachlorobutadiene	IL
Hexachlorocyclopentadiene	IL
Hexachloroethane	IL
Indeno(1,2,3-cd) pyrene	IL
Isophorone	IL
Naphthalene	IL
Nitrobenzene	IL
n-Nitrosodimethylamine	IL
n-Nitrosodi-n-propylamine	IL
n-Nitrosodiphenylamine	IL
Pentachlorophenol	IL
Phenanthrene	IL
Phenol	IL
Pyrene	IL

Method NECi N07-0003

Nitrate-nitrite	IL

Method SM 2320 B-1997

Alkalinity as CaCO3	IL

Method SM 2320 B-2011

Alkalinity as CaCO3	IL

Method SM 2340 B-1997

Hardness	IL

Method SM 2340 B-2011

Hardness	IL

Method SM 2510 B-1997

Conductivity	IL

Method SM 2510 B-2011

Conductivity	IL

Method SM 2540 B-1997

Residue-total	IL

Method SM 2540 B-2015

Residue-total	IL

Method SM 2540 C-1997

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Residue-filterable (TDS)	IL
Method SM 2540 C-2011	
Residue-filterable (TDS)	IL
Method SM 2540 C-2015	
Residue-filterable (TDS)	IL
Method SM 2540 D-1997	
Residue-nonfilterable (TSS)	IL
Method SM 2540 D-2011	
Residue-nonfilterable (TSS)	IL
Method SM 2540 D-2015	
Residue-nonfilterable (TSS)	IL
Method SM 2540 E-1997	
Residue-volatile	IL
Method SM 2540 E-2011	
Residue-volatile	IL
Method SM 3500-Cr B-2009	
Chromium VI	IL
Method SM 3500-Cr B-2011	
Chromium VI	IL
Method SM 4500-Cl F-2000	
Total residual chlorine	IL
Method SM 4500-Cl F-2011	
Total residual chlorine	IL
Method SM 4500-Cl¯ E-1997	
Chloride	IL
Method SM 4500-Cl¯ E-2011	
Chloride	IL
Method SM 4500-F¯ C-1997	
Fluoride	IL
Method SM 4500-F¯ C-2011	
Fluoride	IL
Method SM 4500-H+ B-2000	
pH	IL
Method SM 4500-H+ B-2011	
pH	IL
Method SM 4500-NH3 G-1997	
Ammonia	IL
Total Kjeldahl Nitrogen (TKN)	IL
Method SM 4500-NH3 G-2011	
Ammonia	IL
Total Kjeldahl Nitrogen (TKN)	IL
Method SM 4500-NO2¯ B-2000	
Nitrite	IL
Method SM 4500-NO2¯ B-2011	
Nitrite	IL
Method SM 4500-NO3¯ F-2000	

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Nitrate	IL
Nitrate plus Nitrite as N	IL
Method SM 4500-NO_3^- F-2011	
Nitrate	IL
Nitrate plus Nitrite as N	IL
Method SM 4500-NO_3^- F-2016	
Nitrate	IL
Nitrate plus Nitrite as N	IL
Method SM 4500-O G-2001	
Oxygen, dissolved	IL
Method SM 4500-O G-2011	
Oxygen, dissolved	IL
Method SM 4500-O G-2016	
Oxygen, dissolved	IL
Method SM 4500-P E-1999	
Orthophosphate as P	IL
Phosphorus	IL
Total Phosphate	IL
Method SM 4500-P E-2011	
Orthophosphate as P	IL
Phosphorus	IL
Total Phosphate	IL
Method SM 4500-$S2^-$ F-2000	
Sulfide	IL
Method SM 4500-$S2^-$ F-2011	
Sulfide	IL
Method SM 4500-$S2^-$ F-2017	
Sulfide	IL
Method SM 4500-SO_4^- E-1997	
Sulfate	IL
Method SM 4500-SO_4^- E-2011	
Sulfate	IL
Method SM 5210 B-2001	
Biochemical oxygen demand	IL
Carbonaceous BOD, CBOD	IL
Method SM 5210 B-2011	
Biochemical oxygen demand	IL
Carbonaceous BOD, CBOD	IL
Method SM 5210 B-2016	
Biochemical oxygen demand	IL
Carbonaceous BOD, CBOD	IL
Method SM 5220 C-1997	
Chemical oxygen demand	IL
Method SM 5220 C-2011	
Chemical oxygen demand	IL
Method SM 5220 D-2011	
Chemical oxygen demand	IL

Field of Testing /Matrix: ***CWA (Non Potable Water)***

Method SM 5310 C-2000	
Total organic carbon	IL
Method SM 5310 C-2011	
Total organic carbon	IL
Method SM 5310 C-2014	
Total organic carbon	IL

Field of Testing /Matrix: ***CWA (Solid & Hazardous Material)***

Method EPA 120.1	
Conductivity	IL
Method EPA 160.4	
Residue-volatile	IL
Method EPA 1664A Rev: 1	
Oil & Grease	IL
Method EPA 1664A (SGT-HEM)	
Oil & Grease	IL
Method EPA 1664B	
Oil & Grease	IL
Method EPA 1664B (SGT-HEM)	
Oil & Grease	IL
Method EPA 200.7 Rev: 4.4	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Thallium	IL
Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL
Method EPA 350.1 Rev: 2	
Ammonia as N	IL
Method EPA 351.2 Rev: 2	
Total Kjeldahl Nitrogen (TKN)	IL
Method EPA 353.2 Rev: 2	
Nitrate	IL
Nitrate-nitrite	IL
Method EPA 365.1 Rev: 2	
Orthophosphate as P	IL

Field of Testing /Matrix: ***CWA (Solid & Hazardous Material)***

Phosphorus	IL
Method EPA 420.4 Rev: 1	
Total phenolics	IL
Method SM 2320 B-1997	
Alkalinity as CaCO3	IL
Method SM 2320 B-2011	
Alkalinity as CaCO3	IL
Method SM 2510 B-1997	
Conductivity	IL
Method SM 2510 B-2011	
Conductivity	IL
Method SM 4500-Cl¯ E-2011	
Chloride	IL
Method SM 4500-F¯ C-1997	
Fluoride	IL
Method SM 4500-F¯ C-2011	
Fluoride	IL
Method SM 4500-NH3 G-1997	
Ammonia	IL
Total Kjeldahl Nitrogen (TKN)	IL
Method SM 4500-NH3 G-2011	
Ammonia	IL
Total Kjeldahl Nitrogen (TKN)	IL
Method SM 4500-NO2¯ B-2000	
Nitrite	IL
Method SM 4500-NO2¯ B-2011	
Nitrite	IL
Method SM 4500-NO3¯ F-2000	
Nitrate	IL
Nitrate plus Nitrite as N	IL
Method SM 4500-NO3¯ F-2016	
Nitrate	IL
Nitrate plus Nitrite as N	IL
Method SM 4500-P E-1999	
Orthophosphate as P	IL
Phosphorus	IL
Total Phosphate	IL
Method SM 4500-P E-2011	
Orthophosphate as P	IL
Phosphorus	IL
Total Phosphate	IL
Method SM 4500-S2¯ F-2000	
Sulfide	IL
Method SM 4500-S2¯ F-2017	
Sulfide	IL
Method SM 5210 B-2001	
Biochemical oxygen demand	IL

Field of Testing /Matrix: ***CWA (Solid & Hazardous Material)***	
Carbonaceous BOD, CBOD	IL
Method SM 5210 B-2011	
Biochemical oxygen demand	IL
Carbonaceous BOD, CBOD	IL
Method SM 5220 C-1997	
Chemical oxygen demand	IL
Method SM 5220 C-2011	
Chemical oxygen demand	IL
Method SM 5220 D-2011	
Chemical oxygen demand	IL
Method SM 5310 C-2000	
Total organic carbon	IL
Method SM 5310 C-2014	
Total organic carbon	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

Method EPA 1010B Rev: Update VII	
Flashpoint	IL
Ignitability	IL
Method EPA 1311 Rev: 0	
Toxicity Characteristic Leaching Procedure (TCLP)	IL
Method EPA 1312 Rev: 0	
Synthetic Precipitation Leaching Procedure (SPLP)	IL
Method EPA 6010C	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Lithium	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Strontium	IL
Thallium	IL
Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL
Method EPA 6010D	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL

	Primary AB
Field of Testing /Matrix: ***RCRA (Non Potable Water)***	
Lithium	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Strontium	IL
Thallium	IL
Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL
Method EPA 6020A Rev: 1	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silver	IL
Sodium	IL
Thallium	IL
Vanadium	IL
Zinc	IL
Method EPA 6020B	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silver	IL
Sodium	IL
Thallium	IL
Tin	IL
Vanadium	IL
Zinc	IL

Method EPA 7196A Rev: 1

Chromium VI	IL

Method EPA 7199 Rev: 0

Chromium VI	IL

Method EPA 7470A Rev: 1

Mercury	IL

Method EPA 8015C

Diesel range organics (DRO)	IL
Gasoline range organics (GRO)	IL

Method EPA 8015D

Diesel range organics (DRO)	IL
Gasoline range organics (GRO)	IL

Method EPA 8081B Rev: 2

4,4'-DDD	IL
4,4'-DDE	IL
4,4'-DDT	IL
Alachlor	IL
Aldrin	IL
alpha-BHC (alpha-Hexachlorocyclohexane)	IL
alpha-Chlordane, cis-Chlordane	IL
Atrazine	IL
beta-BHC (beta-Hexachlorocyclohexane)	IL
Chlordane (tech.)(N.O.S.)	IL
delta-BHC	IL
Dieldrin	IL
Endosulfan I	IL
Endosulfan II	IL
Endosulfan sulfate	IL
Endrin	IL
Endrin aldehyde	IL
Endrin ketone	IL
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	IL
gamma-Chlordane	IL
Heptachlor	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

Heptachlor epoxide	IL
Isodrin	IL
Methoxychlor	IL
Toxaphene (Chlorinated camphene)	IL
Method EPA 8082A	
Aroclor-1016 (PCB-1016)	IL
Aroclor-1221 (PCB-1221)	IL
Aroclor-1232 (PCB-1232)	IL
Aroclor-1242 (PCB-1242)	IL
Aroclor-1248 (PCB-1248)	IL
Aroclor-1254 (PCB-1254)	IL
Aroclor-1260 (PCB-1260)	IL
Method EPA 8151A	
2,4,5-T	IL
2,4-D	IL
2,4-DB	IL
Dalapon	IL
Dicamba	IL
Dichloroprop (Dichlorprop)	IL
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	IL
MCPA	IL
MCPP	IL
Pentachlorophenol	IL
Picloram	IL
Silvex (2,4,5-TP)	IL
Method EPA 8260D	
1,1,1,2-Tetrachloroethane	IL
1,1,1-Trichloroethane	IL
1,1,2,2-Tetrachloroethane	IL
1,1,2-Trichloroethane	IL
1,1-Dichloroethane	IL
1,1-Dichloroethylene	IL
1,1-Dichloropropene	IL
1,2,3-Trichlorobenzene	IL
1,2,3-Trichloropropane	IL
1,2,4-Trichlorobenzene	IL
1,2,4-Trimethylbenzene	IL
1,2-Dibromo-3-chloropropane (DBCP)	IL
1,2-Dibromoethane (EDB, Ethylene dibromide)	IL
1,2-Dichlorobenzene (o-Dichlorobenzene)	IL
1,2-Dichloroethane (Ethylene dichloride)	IL
1,2-Dichloropropane	IL
1,3,5-Trimethylbenzene	IL
1,3-Dichlorobenzene	IL
1,3-Dichloropropane	IL
1,4-Dichlorobenzene	IL
1,4-Dioxane (1,4- Diethyleneoxide)	IL
1-Chlorohexane	IL
2,2-Dichloropropane	IL
2-Butanone (Methyl ethyl ketone, MEK)	IL
2-Chloroethyl vinyl ether	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

2-Chlorotoluene	IL
2-Hexanone	IL
2-Nitropropane	IL
4-Chlorotoluene	IL
4-Isopropyltoluene (p-Cymene,p-Isopropyltoluene)	IL
4-Methyl-2-pentanone (MIBK)	IL
Acetone	IL
Acetonitrile	IL
Acrolein (Propenal)	IL
Acrylonitrile	IL
Allyl chloride (3-Chloropropene)	IL
Benzene	IL
Benzyl chloride	IL
Bromobenzene	IL
Bromochloromethane	IL
Bromodichloromethane	IL
Bromoform	IL
Carbon disulfide	IL
Carbon tetrachloride	IL
Chlorobenzene	IL
Chlorodibromomethane	IL
Chloroethane (Ethyl chloride)	IL
Chloroform	IL
Chloroprene (2-Chloro-1,3-butadiene)	IL
cis-1,2-Dichloroethylene	IL
cis-1,3-Dichloropropene	IL
Cyclohexane	IL
Dibromomethane (Methylene bromide)	IL
Dichlorodifluoromethane (Freon-12)	IL
Diethyl ether	IL
Di-isopropylether (DIPE) (Isopropyl Ether)	IL
Ethanol	IL
Ethyl acetate	IL
Ethyl methacrylate	IL
Ethylbenzene	IL
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	IL
Hexachlorobutadiene	IL
Iodomethane (Methyl iodide)	IL
Isobutyl alcohol (2-Methyl-1-propanol)	IL
Isopropyl alcohol (2-Propanol, Isopropanol)	IL
Isopropylbenzene	IL
m+p-xylene	IL
Methacrylonitrile	IL
Methyl bromide (Bromomethane)	IL
Methyl chloride (Chloromethane)	IL
Methyl methacrylate	IL
Methyl tert-butyl ether (MTBE)	IL
Methylene chloride (Dichloromethane)	IL
m-Xylene	IL
Naphthalene	IL
n-Butyl alcohol (1-Butanol, n-Butanol)	IL
n-Butylbenzene	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

n-Propylbenzene	IL
o-Xylene	IL
Pentachloroethane	IL
Propionitrile (Ethyl cyanide)	IL
p-Xylene	IL
sec-Butylbenzene	IL
Styrene	IL
T-amylmethylether (TAME)	IL
tert-Butyl alcohol	IL
tert-Butylbenzene	IL
Tetrachloroethylene (Perchloroethylene)	IL
Toluene	IL
trans-1,2-Dichloroethylene	IL
trans-1,3-Dichloropropylene	IL
trans-1,4-Dichloro-2-butene	IL
Trichloroethene (Trichloroethylene)	IL
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	IL
Vinyl acetate	IL
Vinyl chloride	IL
Xylene (total)	IL

Method EPA 8270E

1,2,4,5-Tetrachlorobenzene	IL
1,2,4-Trichlorobenzene	IL
1,2-Dichlorobenzene (o-Dichlorobenzene)	IL
1,2-Diphenylhydrazine	IL
1,3,5-Trinitrobenzene (1,3,5-TNB)	IL
1,3-Dichlorobenzene	IL
1,3-Dinitrobenzene (1,3-DNB)	IL
1,4-Dichlorobenzene	IL
1,4-Dinitrobenzene	IL
1,4-Dioxane (1,4- Diethyleneoxide)	IL
1,4-Naphthoquinone	IL
1,4-Phenylenediamine	IL
1-Chloronaphthalene	IL
1-Methylnaphthalene	IL
1-Naphthylamine	IL
2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether	IL
2,3,4,6-Tetrachlorophenol	IL
2,4,5-Trichlorophenol	IL
2,4,6-Trichlorophenol	IL
2,4-Dichlorophenol	IL
2,4-Dimethylphenol	IL
2,4-Dinitrophenol	IL
2,4-Dinitrotoluene (2,4-DNT)	IL
2,6-Dichlorophenol	IL
2,6-Dinitrotoluene (2,6-DNT)	IL
2-Acetylaminofluorene	IL
2-Chloronaphthalene	IL
2-Chlorophenol	IL
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	IL
2-Methylaniline (o-Toluidine)	IL
2-Methylnaphthalene	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

2-Methylphenol (o-Cresol)	IL
2-Naphthylamine	IL
2-Nitroaniline	IL
2-Nitrophenol	IL
2-Picoline (2-Methylpyridine)	IL
3,3'-Dichlorobenzidine	IL
3,3'-Dimethylbenzidine	IL
3-Methylcholanthrene	IL
3-Methylphenol (m-Cresol)	IL
3-Nitroaniline	IL
4-Aminobiphenyl	IL
4-Bromophenyl phenyl ether	IL
4-Chloro-3-methylphenol	IL
4-Chloroaniline	IL
4-Chlorophenyl phenylether	IL
4-Dimethyl aminoazobenzene	IL
4-Methylphenol (p-Cresol)	IL
4-Nitroaniline	IL
4-Nitrophenol	IL
4-Nitroquinoline 1-oxide	IL
5-Nitro-o-toluidine	IL
7,12-Dimethylbenz(a) anthracene	IL
a-a-Dimethylphenethylamine	IL
Acenaphthene	IL
Acenaphthylene	IL
Acetophenone	IL
Aniline	IL
Anthracene	IL
Aramite	IL
Benzidine	IL
Benzo(a)anthracene	IL
Benzo(a)pyrene	IL
Benzo(b)fluoranthene	IL
Benzo(g,h,i)perylene	IL
Benzo(k)fluoranthene	IL
Benzoic acid	IL
Benzyl alcohol	IL
bis(2-Chloroethoxy)methane	IL
bis(2-Chloroethyl) ether	IL
bis(2-Ethylhexyl) phthalate (DEHP)	IL
Butyl benzyl phthalate	IL
Carbazole	IL
Carbofuran (Furaden)	IL
Chlorobenzilate	IL
Chrysene	IL
Diallate	IL
Dibenz(a,h) anthracene	IL
Dibenz(a,j) acridine	IL
Dibenzofuran	IL
Diethyl phthalate	IL
Dimethoate	IL
Dimethyl phthalate	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

Di-n-butyl phthalate	IL
Di-n-octyl phthalate	IL
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	IL
Diphenylamine	IL
Disulfoton	IL
Ethyl methanesulfonate	IL
Famphur	IL
Fluoranthene	IL
Fluorene	IL
Hexachlorobenzene	IL
Hexachlorobutadiene	IL
Hexachlorocyclopentadiene	IL
Hexachloroethane	IL
Hexachlorophene	IL
Hexachloropropene	IL
Indeno(1,2,3-cd) pyrene	IL
Isodrin	IL
Isophorone	IL
Isosafrole	IL
Kepone	IL
Methapyrilene	IL
Methyl methanesulfonate	IL
Methyl parathion (Parathion, methyl)	IL
Naphthalene	IL
Nitrobenzene	IL
n-Nitrosodiethylamine	IL
n-Nitrosodimethylamine	IL
n-Nitroso-di-n-butylamine	IL
n-Nitrosodi-n-propylamine	IL
n-Nitrosodiphenylamine	IL
n-Nitrosomethylethylamine	IL
n-Nitrosomorpholine	IL
n-Nitrosopiperidine	IL
n-Nitrosopyrrolidine	IL
o,o,o-Triethyl phosphorothioate	IL
Parathion	IL
Pentachlorobenzene	IL
Pentachloronitrobenzene	IL
Pentachlorophenol	IL
Phenacetin	IL
Phenanthrene	IL
Phenol	IL
Phorate	IL
p-Phenylenediamine	IL
Pronamide (Kerb)	IL
Pyrene	IL
Pyridine	IL
Safrole	IL
Sulfotep (Tetraethyl dithiopyrophosphate)	IL
Thionazin (Zinophos)	IL

Method EPA 9012B

Amenable cyanide	IL

Field of Testing /Matrix: ***RCRA (Non Potable Water)***

Cyanide	IL
Method EPA 9034 Rev: 0	
Sulfide	IL
Method EPA 9038 Rev: 0	
Sulfate	IL
Method EPA 9040B Rev: 2	
pH	IL
Method EPA 9040C	
pH	IL
Method EPA 9050A Rev: 1	
Conductivity	IL
Method EPA 9056A	
Bromide	IL
Chloride	IL
Fluoride	IL
Nitrate	IL
Nitrite	IL
Orthophosphate as P	IL
Sulfate	IL
Method EPA 9060A	
Total organic carbon	IL
Method EPA 9066 Rev: 0	
Total phenolics	IL
Method EPA 9071B	
non-Polar Extractable Material (TPH)	IL
Oil & Grease	IL
Method EPA 9095A	
Paint Filter Test	IL
Method EPA 9095B	
Paint Filter Test	IL
Method EPA 9251 Rev: 0	
Chloride	IL

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

Method EPA 1010B Rev: Update VII	
Flashpoint	IL
Method EPA 1311 Rev: 0	
Toxicity Characteristic Leaching Procedure (TCLP)	IL
Method EPA 1312 Rev: 0	
Synthetic Precipitation Leaching Procedure (SPLP)	IL
Method EPA 6010C	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Lithium	IL
Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Strontium	IL
Thallium	IL
Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL
Method EPA 6010D	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Boron	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Cobalt	IL
Copper	IL
Iron	IL
Lead	IL
Lithium	IL

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

Magnesium	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Potassium	IL
Selenium	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Strontium	IL
Thallium	IL
Tin	IL
Titanium	IL
Vanadium	IL
Zinc	IL

Method EPA 6020A Rev: 1

Antimony	IL
Thallium	IL

Method EPA 6020B

Antimony	IL
Thallium	IL

Method EPA 7196A Rev: 1

Chromium VI	IL

Method EPA 7471B

Mercury	IL

Method EPA 8015C

Diesel range organics (DRO)	IL
Gasoline range organics (GRO)	IL

Method EPA 8015D

Diesel range organics (DRO)	IL
Gasoline range organics (GRO)	IL

Method EPA 8081B Rev: 2

4,4'-DDD	IL
4,4'-DDE	IL
4,4'-DDT	IL
Alachlor	IL
Aldrin	IL
alpha-BHC (alpha-Hexachlorocyclohexane)	IL
alpha-Chlordane, cis-Chlordane	IL
Atrazine	IL
beta-BHC (beta-Hexachlorocyclohexane)	IL
Chlordane (tech.)(N.O.S.)	IL
delta-BHC	IL
Dieldrin	IL
Endosulfan I	IL
Endosulfan II	IL
Endosulfan sulfate	IL
Endrin	IL
Endrin aldehyde	IL
Endrin ketone	IL

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

gamma-Chlordane	IL
Heptachlor	IL
Heptachlor epoxide	IL
Isodrin	IL
Methoxychlor	IL
Toxaphene (Chlorinated camphene)	IL

Method EPA 8082A

Aroclor-1016 (PCB-1016)	IL
Aroclor-1221 (PCB-1221)	IL
Aroclor-1232 (PCB-1232)	IL
Aroclor-1242 (PCB-1242)	IL
Aroclor-1248 (PCB-1248)	IL
Aroclor-1254 (PCB-1254)	IL
Aroclor-1260 (PCB-1260)	IL

Method EPA 8151A

2,4,5-T	IL
2,4-D	IL
2,4-DB	IL
Dalapon	IL
Dicamba	IL
Dichloroprop (Dichlorprop)	IL
MCPA	IL
MCPP	IL
Pentachlorophenol	IL
Picloram	IL
Silvex (2,4,5-TP)	IL

Method EPA 8260D

1,1,1,2-Tetrachloroethane	IL
1,1,1-Trichloroethane	IL
1,1,2,2-Tetrachloroethane	IL
1,1,2-Trichloroethane	IL
1,1-Dichloroethane	IL
1,1-Dichloroethylene	IL
1,1-Dichloropropene	IL
1,2,3-Trichlorobenzene	IL
1,2,3-Trichloropropane	IL
1,2,4-Trichlorobenzene	IL
1,2,4-Trimethylbenzene	IL
1,2-Dibromo-3-chloropropane (DBCP)	IL
1,2-Dibromoethane (EDB, Ethylene dibromide)	IL
1,2-Dichlorobenzene (o-Dichlorobenzene)	IL
1,2-Dichloroethane (Ethylene dichloride)	IL
1,2-Dichloropropane	IL
1,3,5-Trimethylbenzene	IL
1,3-Dichlorobenzene	IL
1,3-Dichloropropane	IL
1,4-Dichlorobenzene	IL
1,4-Dioxane (1,4- Diethyleneoxide)	IL
1-Chlorohexane	IL
2,2-Dichloropropane	IL
2-Butanone (Methyl ethyl ketone, MEK)	IL

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

2-Chloroethyl vinyl ether	IL
2-Chlorotoluene	IL
2-Hexanone	IL
2-Nitropropane	IL
4-Chlorotoluene	IL
4-Isopropyltoluene (p-Cymene,p-Isopropyltoluene)	IL
4-Methyl-2-pentanone (MIBK)	IL
Acetone	IL
Acetonitrile	IL
Acrolein (Propenal)	IL
Acrylonitrile	IL
Allyl chloride (3-Chloropropene)	IL
Benzene	IL
Benzyl chloride	IL
Bromobenzene	IL
Bromochloromethane	IL
Bromodichloromethane	IL
Bromoform	IL
Carbon disulfide	IL
Carbon tetrachloride	IL
Chlorobenzene	IL
Chlorodibromomethane	IL
Chloroethane (Ethyl chloride)	IL
Chloroform	IL
Chloroprene (2-Chloro-1,3-butadiene)	IL
cis-1,2-Dichloroethylene	IL
cis-1,3-Dichloropropene	IL
Cyclohexane	IL
Dibromomethane (Methylene bromide)	IL
Dichlorodifluoromethane (Freon-12)	IL
Diethyl ether	IL
Di-isopropylether (DIPE) (Isopropyl Ether)	IL
Ethanol	IL
Ethyl acetate	IL
Ethyl methacrylate	IL
Ethylbenzene	IL
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	IL
Hexachlorobutadiene	IL
Iodomethane (Methyl iodide)	IL
Isobutyl alcohol (2-Methyl-1-propanol)	IL
Isopropyl alcohol (2-Propanol, Isopropanol)	IL
Isopropylbenzene	IL
m+p-xylene	IL
Methacrylonitrile	IL
Methyl bromide (Bromomethane)	IL
Methyl chloride (Chloromethane)	IL
Methyl methacrylate	IL
Methyl tert-butyl ether (MTBE)	IL
Methylene chloride (Dichloromethane)	IL
m-Xylene	IL
Naphthalene	IL
n-Butyl alcohol (1-Butanol, n-Butanol)	IL

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

n-Butylbenzene	IL
n-Propylbenzene	IL
o-Xylene	IL
Pentachloroethane	IL
Propionitrile (Ethyl cyanide)	IL
p-Xylene	IL
sec-Butylbenzene	IL
Styrene	IL
T-amylmethylether (TAME)	IL
tert-Butyl alcohol	IL
tert-Butylbenzene	IL
Tetrachloroethylene (Perchloroethylene)	IL
Toluene	IL
trans-1,2-Dichloroethylene	IL
trans-1,3-Dichloropropylene	IL
trans-1,4-Dichloro-2-butene	IL
Trichloroethene (Trichloroethylene)	IL
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	IL
Vinyl acetate	IL
Vinyl chloride	IL
Xylene (total)	IL

Method EPA 8270E

1,2,4,5-Tetrachlorobenzene	IL
1,2,4-Trichlorobenzene	IL
1,2-Dichlorobenzene (o-Dichlorobenzene)	IL
1,2-Diphenylhydrazine	IL
1,3,5-Trinitrobenzene (1,3,5-TNB)	IL
1,3-Dichlorobenzene	IL
1,3-Dinitrobenzene (1,3-DNB)	IL
1,4-Dichlorobenzene	IL
1,4-Dinitrobenzene	IL
1,4-Dioxane (1,4- Diethyleneoxide)	IL
1,4-Naphthoquinone	IL
1,4-Phenylenediamine	IL
1-Chloronaphthalene	IL
1-Methylnaphthalene	IL
1-Naphthylamine	IL
2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether	IL
2,3,4,6-Tetrachlorophenol	IL
2,4,5-Trichlorophenol	IL
2,4,6-Trichlorophenol	IL
2,4-Dichlorophenol	IL
2,4-Dimethylphenol	IL
2,4-Dinitrophenol	IL
2,4-Dinitrotoluene (2,4-DNT)	IL
2,6-Dichlorophenol	IL
2,6-Dinitrotoluene (2,6-DNT)	IL
2-Acetylaminofluorene	IL
2-Chloronaphthalene	IL
2-Chlorophenol	IL
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	IL
2-Methylaniline (o-Toluidine)	IL

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

2-Methylnaphthalene	IL
2-Methylphenol (o-Cresol)	IL
2-Naphthylamine	IL
2-Nitroaniline	IL
2-Nitrophenol	IL
2-Picoline (2-Methylpyridine)	IL
3,3'-Dichlorobenzidine	IL
3,3'-Dimethylbenzidine	IL
3-Methylcholanthrene	IL
3-Methylphenol (m-Cresol)	IL
3-Nitroaniline	IL
4-Aminobiphenyl	IL
4-Bromophenyl phenyl ether	IL
4-Chloro-3-methylphenol	IL
4-Chloroaniline	IL
4-Chlorophenyl phenylether	IL
4-Dimethyl aminoazobenzene	IL
4-Methylphenol (p-Cresol)	IL
4-Nitroaniline	IL
4-Nitrophenol	IL
4-Nitroquinoline 1-oxide	IL
5-Nitro-o-toluidine	IL
7,12-Dimethylbenz(a) anthracene	IL
a-a-Dimethylphenethylamine	IL
Acenaphthene	IL
Acenaphthylene	IL
Acetophenone	IL
Aniline	IL
Anthracene	IL
Aramite	IL
Benzidine	IL
Benzo(a)anthracene	IL
Benzo(a)pyrene	IL
Benzo(b)fluoranthene	IL
Benzo(g,h,i)perylene	IL
Benzo(k)fluoranthene	IL
Benzoic acid	IL
Benzyl alcohol	IL
bis(2-Chloroethoxy)methane	IL
bis(2-Chloroethyl) ether	IL
bis(2-Ethylhexyl) phthalate (DEHP)	IL
Butyl benzyl phthalate	IL
Carbazole	IL
Carbofuran (Furaden)	IL
Chlorobenzilate	IL
Chrysene	IL
Diallate	IL
Dibenz(a,h) anthracene	IL
Dibenz(a,j) acridine	IL
Dibenzofuran	IL
Diethyl phthalate	IL
Dimethoate	IL

Field of Testing /Matrix: RCRA (Solid & Hazardous Material)	Primary AB
Dimethyl phthalate	IL
Di-n-butyl phthalate	IL
Di-n-octyl phthalate	IL
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	IL
Diphenylamine	IL
Disulfoton	IL
Ethyl methanesulfonate	IL
Famphur	IL
Fluoranthene	IL
Fluorene	IL
Hexachlorobenzene	IL
Hexachlorobutadiene	IL
Hexachlorocyclopentadiene	IL
Hexachloroethane	IL
Hexachlorophene	IL
Hexachloropropene	IL
Indeno(1,2,3-cd) pyrene	IL
Isodrin	IL
Isophorone	IL
Isosafrole	IL
Kepone	IL
Methapyrilene	IL
Methyl methanesulfonate	IL
Methyl parathion (Parathion, methyl)	IL
Naphthalene	IL
Nitrobenzene	IL
n-Nitrosodiethylamine	IL
n-Nitrosodimethylamine	IL
n-Nitroso-di-n-butylamine	IL
n-Nitrosodi-n-propylamine	IL
n-Nitrosodiphenylamine	IL
n-Nitrosomethylethylamine	IL
n-Nitrosomorpholine	IL
n-Nitrosopiperidine	IL
n-Nitrosopyrrolidine	IL
o,o,o-Triethyl phosphorothioate	IL
Parathion	IL
Pentachlorobenzene	IL
Pentachloronitrobenzene	IL
Pentachlorophenol	IL
Phenacetin	IL
Phenanthrene	IL
Phenol	IL
Phorate	IL
p-Phenylenediamine	IL
Pronamide (Kerb)	IL
Pyrene	IL
Pyridine	IL
Safrole	IL
Sulfotep (Tetraethyl dithiopyrophosphate)	IL
Thionazin (Zinophos)	IL

Method EPA 9012B

Field of Testing /Matrix: ***RCRA (Solid & Hazardous Material)***

Amenable cyanide	IL
Cyanide	IL
Method EPA 9034 Rev: 0	
Sulfide	IL
Method EPA 9045C Rev: 3	
pH	IL
Method EPA 9045D	
pH	IL
Method EPA 9050A Rev: 1	
Conductivity	IL
Method EPA 9056A	
Bromide	IL
Chloride	IL
Fluoride	IL
Nitrate	IL
Nitrite	IL
Orthophosphate as P	IL
Sulfate	IL
Method EPA 9060A	
Total organic carbon	IL
Method EPA 9066 Rev: 0	
Total phenolics	IL
Method EPA 9071B	
non-Polar Extractable Material (TPH)	IL
Oil & Grease	IL
Method EPA 9095A	
Paint Filter Test	IL
Method EPA 9095B	
Paint Filter Test	IL
Method EPA 9251 Rev: 0	
Chloride	IL
Method SM 4500-Cl^- E-1997	
Chloride	IL

Field of Testing /Matrix: ***SDWA (Potable Water)***

Method EPA 180.1 Rev: 2	
Turbidity	IL
Method EPA 200.7 Rev: 4.4	
Aluminum	IL
Barium	IL
Beryllium	IL
Cadmium	IL
Calcium	IL
Chromium	IL
Copper	IL
Iron	IL
Magnesium	IL
Manganese	IL
Nickel	IL
Silica as SiO2	IL
Silver	IL
Sodium	IL
Zinc	IL
Method EPA 200.8 Rev: 5.4	
Aluminum	IL
Antimony	IL
Arsenic	IL
Barium	IL
Beryllium	IL
Cadmium	IL
Chromium	IL
Copper	IL
Lead	IL
Manganese	IL
Molybdenum	IL
Nickel	IL
Selenium	IL
Silver	IL
Thallium	IL
Zinc	IL
Method EPA 245.1 Rev: 3	
Mercury	IL
Method EPA 300.0 Rev: 2.1	
Chloride	IL
Fluoride	IL
Nitrate	IL
Nitrite	IL
Orthophosphate as P	IL
Sulfate	IL
Method EPA 335.4 Rev: 1	
Cyanide	IL
Method EPA 353.2 Rev: 2	
Nitrate	IL
Method EPA 365.1 Rev: 2	
Orthophosphate as P	IL

Field of Testing /Matrix: ***SDWA (Potable Water)***

Method SM 2320 B Rev: 20th ED	
Alkalinity as CaCO3	IL
Method SM 2320 B Rev: 23rd ED	
Alkalinity as CaCO3	IL
Method SM 2340 B Rev: 20th ED	
Hardness	IL
Method SM 2340 B Rev: 23rd ED	
Hardness	IL
Method SM 2510 B Rev: 20th ED	
Conductivity	IL
Method SM 2510 B Rev: 23rd ED	
Conductivity	IL
Method SM 2540 C Rev: 20th ED	
Total dissolved solids	IL
Method SM 2540 C Rev: 23rd ED	
Total dissolved solids	IL
Method SM 4500-Cl F Rev: 20th ED	
Chlorine	IL
Method SM 4500-F^- C Rev: 21st ED	
Fluoride	IL
Method SM 4500-F^- C Rev: 23rd ED	
Fluoride	IL
Method SM 4500-H+ B Rev: 20th ED	
pH	IL
Method SM 4500-H+ B Rev: 22nd ED	
pH	IL
Method SM 4500-$NO2^-$ B Rev: 20th ED	
Nitrite	IL
Method SM 4500-$NO2^-$ B Rev: 23rd ED	
Nitrite	IL
Method SM 4500-$NO3^-$ F Rev: 20th ED	
Nitrate	IL
Method SM 4500-$NO3^-$ F Rev: 23rd ED	
Nitrate	IL
Method SM 4500-P E Rev: 20th ED	
Total Phosphate	IL
Method SM 4500-P E Rev: 23rd ED	
Orthophosphate as P	IL
Total Phosphate	IL
Method SM 4500-$SO4^-$ E Rev: 20th ED	
Sulfate	IL
Method SM 4500-$SO4^-$ E Rev: 23rd ED	
Sulfate	IL
Method SM 5310 C Rev: 23rd ED	
Dissolved organic carbon (DOC)	IL
Total organic carbon	IL

End of Scope of Accreditation

The State of Wisconsin
Department of Natural Resources

has granted

Accreditation under NR 149

to

Eurofins Sacramento

FID: 998204680

The laboratory is accredited to perform environmental sample analysis in support of covered environmental programs per matrix for the combination of analyte and technology or analyte and method as specified in the attached Scopes of Accreditation.

Printed on: **August 08, 2024**

Expires on: **August 31, 2025**

Zana Sijan, Manager
Certification Services

This certificate does not guarantee validity of data generated, but indicates the methodology, equipment, quality control practices, records, and proficiency of the laboratory have been reviewed and found to satisfy the requirements of chapter NR 149, Wisconsin Administrative Code.

Wisconsin Scope of Accreditation

Laboratory FID: 998204680
CERTIFICATION
Aqueous (Non-potable Water)

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Printed on: **8/8/2024**
Expires on: **8/31/2025**

High Resolution Gas Chromatography-Mass Spectrometry (HRGC/MS)	**## DIOXINS & FURANS (group)**
	## PCB CONGENERS (group)
Liquid Chromatography-Mass Spectrometry (LC/MS)	**## PFAS (group)**

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

Wisconsin Scope of Accreditation

Laboratory FID: 998204680
CERTIFICATION
Drinking Water (Potable Water)

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Printed on: **8/8/2024**
Expires on: **8/31/2025**

SOC - Dioxin	**2,3,7,8-TCDD (Dioxin) - EPA 1613**
SOC - Miscellaneous	**## PFAS (group) – EPA 537.1 (18)**

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

Wisconsin Scope of Accreditation

Laboratory FID: 998204680
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Printed on: 8/8/2024
Expires on: 8/31/2025

High Resolution Gas Chromatography-Mass Spectrometry (HRGC/MS)	**## DIOXINS & FURANS (group)**
	## PCB CONGENERS (group)
Liquid Chromatography-Mass Spectrometry (LC/MS)	**## PFAS (group)**

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

Oregon

Environmental Laboratory Accreditation Program

NELAP Recognized

Eurofins Sacramento

4040

880 Riverside Parkway

West Sacramento, CA 95605

IS GRANTED APPROVAL BY ORELAP UNDER THE 2016 TNI STANDARDS, TO PERFORM ANALYSES ON ENVIRONMENTAL SAMPLES IN MATRICES AS LISTED BELOW :

Air	Drinking Water	Non-Potable Water	Solids & Chem. Waste	Tissue
	Chemistry	Chemistry	Chemistry	Chemistry

AND AS RECORDED IN THE LIST OF APPROVED ANALYTES, METHODS, ANALYTICAL TECHNIQUES, AND FIELDS OF TESTING ISSUED CONCURRENTLY WITH THIS CERTIFICATE AND REVISED AS NECESSARY.

ACCREDITED STATUS DEPENDS ON SUCCESSFUL ONGOING PARTICIPATION IN THE PROGRAM AND CONTINUED COMPLIANCE WITH THE STANDARDS.

CUSTOMERS ARE URGED TO VERIFY THE LABORATORY'S CURRENT ACCREDITATION STATUS IN OREGON.

Mary Fuyn for Steve Jetter

Oregon State Public Health Laboratory
ORELAP Program Manager
7202 NE Evergreen Parkway, Suite 100
Hillsboro, OR 97124

EFFECTIVE DATE : **01/30/2025**

EXPIRATION DATE : **01/29/2026**

Certificate No : **4040 - 024**

Oregon

Environmental Laboratory Accreditation Program

ORELAP Fields of Accreditation

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

ORELAP ID: 4040
EPA CODE: CA00044
Certificate: 4040 - 024

Issue Date: 1/30/2025 Expiration Date: 1/29/2026

As of 1/30/2025 this list supersedes all previous lists for this certificate number.

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue							
	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				
		9438	Hpcdd, total				
		9444	Hpcdf, total				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				
		9615	TCDF, total				
	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6915	Perfluorobutanoic acid (PFBA)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6903	Perfluorododecanoic acid (PFDoA)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6906	Perfluorononanoic acid (PFNA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		6914	Perfluoropentanoic acid (PFPeA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
	EPA 1668A				1999	10262007	Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS
		8914	Sum - Dichlorobiphenyls (BZ-12- + BZ-13)				
		8916	Sum - Heptachlorobiphenyls (BZ-171 + BZ-173)				
		8917	Sum - Heptachlorobiphenyls (BZ-180 + BZ-193)				
		8919	Sum - Hexachlorobiphenyls (BZ-128 + BZ-166)				
		8922	Sum - Hexachlorobiphenyls (BZ-129 + BZ-138 + BZ-163)				
		8927	Sum - Hexachlorobiphenyls (BZ-135 + BZ-151)				
		8928	Sum - Hexachlorobiphenyls (BZ-139 + BZ-140)				
		8929	Sum - Hexachlorobiphenyls (BZ-147 + BZ-149)				
		8931	Sum - Hexachlorobiphenyls (BZ-153 + BZ-168)				
		8932	Sum - Hexachlorobiphenyls (BZ-156 + BZ-157)				
		8934	Sum - Octachlorobiphenyls (BZ-198 + BZ-199)				
		8936	Sum - Pentachlorobiphenyls (BZ-107 + BZ-124)				
		8938	Sum - Pentachlorobiphenyls (BZ-110 + BZ-115)				
		8941	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)				
		8943	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)				
		8947	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1668A				1999	10262007	Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS
		8948	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)				
		8949	Sum - Pentachlorobiphenyls (BZ-93 + BZ-100)				
		8951	Sum - Pentachlorobiphenyls (BZ-98 + BZ-102)				
		8954	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-71)				
		8957	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)				
		8959	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)				
		8961	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)				
		8962	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)				
		8963	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)				
		8966	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)				
		8967	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)				
		8968	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)				
		8969	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)				
	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)				
		9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)				
		9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)				
		9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)				
		9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)				
		9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)				
		9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)				
		9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)				
		9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)				
		9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)				
		9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)				
		9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)				
		9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)				
		9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)				
		9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)				
		9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)				
		9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)				
		9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)				
		9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)				
		9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)				
		9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)				
		9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)				
		9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)				
		9122	2,2',3,3',4-Pentachlorobiphenyl (BZ-82)				
		9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)				
		9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)				
		9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)				
		9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)				
		9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)				
		9129	2,2',3,3',5-Pentachlorobiphenyl (BZ-83)				
		9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)				
		9131	2,2',3,3',6-Pentachlorobiphenyl (BZ-84)				
		9132	2,2',3,3'-Tetrachlorobiphenyl (BZ-40)				
		9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)				
		9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)				
		9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)				
		9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)				
		9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)				
		9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)				
		9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)				
		9155	2,2',3,4',5-Pentachlorobiphenyl (BZ-90)				
		9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)				
		9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)				
		9160	2,2',3,4',6-Pentachlorobiphenyl (BZ-91)				
		9162	2,2',3,4'-Tetrachlorobiphenyl (BZ-42)				
		9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)				
		9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)				
		9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)				
		9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)				
		9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)				
		9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)				
		9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)				
		9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)				
		9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)				
		9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)				
		9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)				
		9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)				
		8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)				
		9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)				
		9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)				
		9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)				
		9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)				
		9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)				
		9153	2,2',3,4,5-Pentachlorobiphenyl (BZ-86)				
		9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)				
		9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)				
		9158	2,2',3,4,6-Pentachlorobiphenyl (BZ-88)				
		9163	2,2',3,4-Tetrachlorobiphenyl (BZ-41)				
		9166	2,2',3,5',6-Pentachlorobiphenyl (BZ-95)				
		8945	2,2',3,5'-Tetrachlorobiphenyl (BZ-44)				
		9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Biological Tissue	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)				
		9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)				
		9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)				
		9168	2,2',3,5,6-Pentachlorobiphenyl (BZ-93)				
		9169	2,2',3,5-Tetrachlorobiphenyl (BZ-43)				
		9171	2,2',3,6'-Tetrachlorobiphenyl (BZ-46)				
		9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)				
		9172	2,2',3,6-Tetrachlorobiphenyl (BZ-45)				
		9173	2,2',3-Trichlorobiphenyl (BZ-16)				
		9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)				
		9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)				
		9175	2,2',4,4',5-Pentachlorobiphenyl (BZ-99)				
		9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)				
		9177	2,2',4,4',6-Pentachlorobiphenyl (BZ-100)				
		9178	2,2',4,4'-Tetrachlorobiphenyl (BZ-47)				
		9179	2,2',4,5',6-Pentachlorobiphenyl (BZ-103)				
		8950	2,2',4,5'-Tetrachlorobiphenyl (BZ-49)				
		8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)				
		9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)				
		9181	2,2',4,5-Tetrachlorobiphenyl (BZ-48)				
		9183	2,2',4,6'-Tetrachlorobiphenyl (BZ-51)				
		9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)				

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Biological Tissue	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9184	2,2',4,6-Tetrachlorobiphenyl (BZ-50)				
		9185	2,2',4-Trichlorobiphenyl (BZ-17)				
		8955	2,2',5,5'-Tetrachlorobiphenyl (BZ-52)				
		9186	2,2',5,6'-Tetrachlorobiphenyl (BZ-53)				
		8930	2,2',5-Trichlorobiphenyl (BZ-18)				
		9187	2,2',6,6'-Tetrachlorobiphenyl (BZ-54)				
		9188	2,2',6-Trichlorobiphenyl (BZ-19)				
		9189	2,2'-Dichlorobiphenyl (BZ-4)				
		9224	2,3',4',5',6-Pentachlorobiphenyl (BZ-125)				
		9229	2,3',4',5'-Tetrachlorobiphenyl (BZ-76)				
		9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)				
		9230	2,3',4',5-Tetrachlorobiphenyl (BZ-70)				
		9237	2,3',4',6-Tetrachlorobiphenyl (BZ-71)				
		9239	2,3',4'-Trichlorobiphenyl (BZ-33)				
		9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)				
		9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)				
		9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)				
		8995	2,3',4,4',5-Pentachlorobiphenyl (BZ-118)				
		9220	2,3',4,4',6-Pentachlorobiphenyl (BZ-119)				
		8960	2,3',4,4'-Tetrachlorobiphenyl (BZ-66)				
		9226	2,3',4,5',6-Pentachlorobiphenyl (BZ-121)				
		9231	2,3',4,5'-Tetrachlorobiphenyl (BZ-68)				
		9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)				
		9232	2,3',4,5-Tetrachlorobiphenyl (BZ-67)				

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		9235	2,3',4,6-Tetrachlorobiphenyl (BZ-69)				
		9240	2,3',4-Trichlorobiphenyl (BZ-25)				
		9244	2,3',5',6-Tetrachlorobiphenyl (BZ-73)				
		9246	2,3',5'-Trichlorobiphenyl (BZ-34)				
		9242	2,3',5,5'-Tetrachlorobiphenyl (BZ-72)				
		8935	2,3',5-Trichlorobiphenyl (BZ-26)				
		9248	2,3',6-Trichlorobiphenyl (BZ-27)				
		9249	2,3'-Dichlorobiphenyl (BZ-6)				
		9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)				
		9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)				
		9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)				
		9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)				
		9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)				
		9205	2,3,3',4',5-Pentachlorobiphenyl (BZ-107)				
		8990	2,3,3',4',6-Pentachlorobiphenyl (BZ-110)				
		9207	2,3,3',4'-Tetrachlorobiphenyl (BZ-56)				
		9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)				
		9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)				
		9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)				
		9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)				
		9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)				
		9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)				
		9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)				
		8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)				

Oregon

Environmental Laboratory Accreditation Program

ORELAP Fields of Accreditation

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		9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)				
		9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)				
		9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)				
		9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)				
		9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)				
		9204	2,3,3',4,5-Pentachlorobiphenyl (BZ-106)				
		9206	2,3,3',4,6-Pentachlorobiphenyl (BZ-109)				
		9208	2,3,3',4-Tetrachlorobiphenyl (BZ-55)				
		9212	2,3,3',5',6-Pentachlorobiphenyl (BZ-113)				
		9213	2,3,3',5'-Tetrachlorobiphenyl (BZ-58)				
		9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)				
		9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)				
		9211	2,3,3',5,6-Pentachlorobiphenyl (BZ-112)				
		9214	2,3,3',5-Tetrachlorobiphenyl (BZ-57)				
		9215	2,3,3',6-Tetrachlorobiphenyl (BZ-59)				
		9216	2,3,3'-Trichlorobiphenyl (BZ-20)				
		9227	2,3,4',5,6-Pentachlorobiphenyl (BZ-117)				
		9233	2,3,4',5-Tetrachlorobiphenyl (BZ-63)				
		9236	2,3,4',6-Tetrachlorobiphenyl (BZ-64)				
		9241	2,3,4'-Trichlorobiphenyl (BZ-22)				
		9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)				
		9005	2,3,4,4',5-Pentachlorobiphenyl (BZ-114)				
		9219	2,3,4,4',6-Pentachlorobiphenyl (BZ-115)				

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		9221	2,3,4,4'-Tetrachlorobiphenyl (BZ-60)				
		9225	2,3,4,5,6-Pentachlorobiphenyl (BZ-116)				
		9228	2,3,4,5-Tetrachlorobiphenyl (BZ-61)				
		9234	2,3,4,6-Tetrachlorobiphenyl (BZ-62)				
		9238	2,3,4-Trichlorobiphenyl (BZ-21)				
		9243	2,3,5,6-Tetrachlorobiphenyl (BZ-65)				
		9245	2,3,5-Trichlorobiphenyl (BZ-23)				
		9247	2,3,6-Trichlorobiphenyl (BZ-24)				
		8920	2,3-Dichlorobiphenyl (BZ-5)				
		8940	2,4',5-Trichlorobiphenyl (BZ-31)				
		9255	2,4',6-Trichlorobiphenyl (BZ-32)				
		9256	2,4'-Dichlorobiphenyl (BZ-8)				
		9250	2,4,4',5-Tetrachlorobiphenyl (BZ-74)				
		9251	2,4,4',6-Tetrachlorobiphenyl (BZ-75)				
		9252	2,4,4'-Trichlorobiphenyl (BZ-28)				
		9253	2,4,5-Trichlorobiphenyl (BZ-29)				
		9254	2,4,6-Trichlorobiphenyl (BZ-30)				
		9257	2,4-Dichlorobiphenyl (BZ-7)				
		9258	2,5-Dichlorobiphenyl (BZ-9)				
		9259	2,6-Dichlorobiphenyl (BZ-10)				
		8915	2-Chlorobiphenyl (BZ-1)				
		9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)				
		9015	3,3',4,4',5-Pentachlorobiphenyl (BZ-126)				
		8965	3,3',4,4'-Tetrachlorobiphenyl (BZ-77)				
		9261	3,3',4,5'-Tetrachlorobiphenyl (BZ-79)				
		9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)				
		9262	3,3',4,5-Tetrachlorobiphenyl (BZ-78)				
		9263	3,3',4-Trichlorobiphenyl (BZ-35)				

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		9264	3,3',5,5'-Tetrachlorobiphenyl (BZ-80)				
		9265	3,3',5-Trichlorobiphenyl (BZ-36)				
		8925	3,3'-Dichlorobiphenyl (BZ-11)				
		9268	3,4',5-Trichlorobiphenyl (BZ-39)				
		9269	3,4'-Dichlorobiphenyl (BZ-13)				
		8970	3,4,4',5-Tetrachlorobiphenyl (BZ-81)				
		9266	3,4,4'-Trichlorobiphenyl (BZ-37)				
		9267	3,4,5-Trichlorobiphenyl (BZ-38)				
		9270	3,4-Dichlorobiphenyl (BZ-12)				
		9271	3,5-Dichlorobiphenyl (BZ-14)				
		9272	3-Chlorobiphenyl (BZ-2)				
		9273	4,4'-Dichlorobiphenyl (BZ-15)				
		9274	4-Chlorobiphenyl (BZ-3)				
		9105	Decachlorobiphenyl (BZ-209)				
		8876	Total Dichlorobiphenyls				
		8877	Total Heptachlorobiphenyls				
		8888	Total Hexachlorobiphenyls				
		8889	Total Monochlorobiphenyls				
		8891	Total Nonachlorobiphenyls				
		8892	Total Octachlorobiphenyls				
		8896	Total Pentachlorobiphenyls				
		8893	Total Tetrachlorobiphenyls				
		8894	Total Trichlorobiphenyls				
	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)				
		9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)				
		9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)				
		9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)				
		9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)				
		9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)				
		9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)				
		9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)				
		9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)				
		9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)				
		9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)				
		9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)				
		9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)				
		9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)				
		9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)				
		9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)				
		9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)				
		9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)				
		9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)				
		9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)				
		9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)				
		9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)				
		9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)				
		9122	2,2',3,3',4-Pentachlorobiphenyl (BZ-82)				
		9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)				
		9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)				
		9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)				

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		9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)				
		9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)				
		9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)				
		9129	2,2',3,3',5-Pentachlorobiphenyl (BZ-83)				
		9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)				
		9131	2,2',3,3',6-Pentachlorobiphenyl (BZ-84)				
		9132	2,2',3,3'-Tetrachlorobiphenyl (BZ-40)				
		9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)				
		9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)				
		9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)				
		9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)				
		9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)				
		9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)				
		9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)				
		9155	2,2',3,4',5-Pentachlorobiphenyl (BZ-90)				
		9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)				
		9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)				
		9160	2,2',3,4',6-Pentachlorobiphenyl (BZ-91)				
		9162	2,2',3,4'-Tetrachlorobiphenyl (BZ-42)				
		9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)				
		9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)				
		9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)				

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		9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)				
		9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)				
		9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)				
		9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)				
		9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)				
		9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)				
		9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)				
		9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)				
		9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)				
		9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)				
		8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)				
		9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)				
		9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)				
		9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)				
		9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)				
		9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)				
		9153	2,2',3,4,5-Pentachlorobiphenyl (BZ-86)				
		9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)				
		9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)				
		9158	2,2',3,4,6-Pentachlorobiphenyl (BZ-88)				
		9163	2,2',3,4-Tetrachlorobiphenyl (BZ-41)				
		9166	2,2',3,5',6-Pentachlorobiphenyl (BZ-95)				

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		8945	2,2',3,5'-Tetrachlorobiphenyl (BZ-44)				
		9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)				
		9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)				
		9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)				
		9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)				
		9168	2,2',3,5,6-Pentachlorobiphenyl (BZ-93)				
		9169	2,2',3,5-Tetrachlorobiphenyl (BZ-43)				
		9171	2,2',3,6'-Tetrachlorobiphenyl (BZ-46)				
		9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)				
		9172	2,2',3,6-Tetrachlorobiphenyl (BZ-45)				
		9173	2,2',3-Trichlorobiphenyl (BZ-16)				
		9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)				
		9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)				
		9175	2,2',4,4',5-Pentachlorobiphenyl (BZ-99)				
		9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)				
		9177	2,2',4,4',6-Pentachlorobiphenyl (BZ-100)				
		9178	2,2',4,4'-Tetrachlorobiphenyl (BZ-47)				
		9179	2,2',4,5',6-Pentachlorobiphenyl (BZ-103)				
		8950	2,2',4,5'-Tetrachlorobiphenyl (BZ-49)				
		8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)				
		9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)				
		9181	2,2',4,5-Tetrachlorobiphenyl (BZ-48)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9183	2,2',4,6'-Tetrachlorobiphenyl (BZ-51)				
		9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)				
		9184	2,2',4,6-Tetrachlorobiphenyl (BZ-50)				
		9185	2,2',4-Trichlorobiphenyl (BZ-17)				
		8955	2,2',5,5'-Tetrachlorobiphenyl (BZ-52)				
		9186	2,2',5,6'-Tetrachlorobiphenyl (BZ-53)				
		8930	2,2',5-Trichlorobiphenyl (BZ-18)				
		9187	2,2',6,6'-Tetrachlorobiphenyl (BZ-54)				
		9188	2,2',6-Trichlorobiphenyl (BZ-19)				
		9189	2,2'-Dichlorobiphenyl (BZ-4)				
		9224	2,3',4',5',6-Pentachlorobiphenyl (BZ-125)				
		9229	2,3',4',5'-Tetrachlorobiphenyl (BZ-76)				
		9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)				
		9230	2,3',4',5-Tetrachlorobiphenyl (BZ-70)				
		9237	2,3',4',6-Tetrachlorobiphenyl (BZ-71)				
		9239	2,3',4'-Trichlorobiphenyl (BZ-33)				
		9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)				
		9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)				
		9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)				
		8995	2,3',4,4',5-Pentachlorobiphenyl (BZ-118)				
		9220	2,3',4,4',6-Pentachlorobiphenyl (BZ-119)				
		8960	2,3',4,4'-Tetrachlorobiphenyl (BZ-66)				
		9226	2,3',4,5',6-Pentachlorobiphenyl (BZ-121)				
		9231	2,3',4,5'-Tetrachlorobiphenyl (BZ-68)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)				
		9232	2,3',4,5-Tetrachlorobiphenyl (BZ-67)				
		9235	2,3',4,6-Tetrachlorobiphenyl (BZ-69)				
		9240	2,3',4-Trichlorobiphenyl (BZ-25)				
		9244	2,3',5',6-Tetrachlorobiphenyl (BZ-73)				
		9246	2,3',5'-Trichlorobiphenyl (BZ-34)				
		9242	2,3',5,5'-Tetrachlorobiphenyl (BZ-72)				
		8935	2,3',5-Trichlorobiphenyl (BZ-26)				
		9248	2,3',6-Trichlorobiphenyl (BZ-27)				
		9249	2,3'-Dichlorobiphenyl (BZ-6)				
		9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)				
		9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)				
		9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)				
		9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)				
		9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)				
		9205	2,3,3',4',5-Pentachlorobiphenyl (BZ-107)				
		8990	2,3,3',4',6-Pentachlorobiphenyl (BZ-110)				
		9207	2,3,3',4'-Tetrachlorobiphenyl (BZ-56)				
		9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)				
		9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)				
		9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)				
		9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)				
		9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)				
		9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)				
		8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)				
		9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)				
		9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)				
		9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)				
		9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)				
		9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)				
		9204	2,3,3',4,5-Pentachlorobiphenyl (BZ-106)				
		9206	2,3,3',4,6-Pentachlorobiphenyl (BZ-109)				
		9208	2,3,3',4-Tetrachlorobiphenyl (BZ-55)				
		9212	2,3,3',5',6-Pentachlorobiphenyl (BZ-113)				
		9213	2,3,3',5'-Tetrachlorobiphenyl (BZ-58)				
		9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)				
		9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)				
		9211	2,3,3',5,6-Pentachlorobiphenyl (BZ-112)				
		9214	2,3,3',5-Tetrachlorobiphenyl (BZ-57)				
		9215	2,3,3',6-Tetrachlorobiphenyl (BZ-59)				
		9216	2,3,3'-Trichlorobiphenyl (BZ-20)				
		9227	2,3,4',5,6-Pentachlorobiphenyl (BZ-117)				
		9233	2,3,4',5-Tetrachlorobiphenyl (BZ-63)				
		9236	2,3,4',6-Tetrachlorobiphenyl (BZ-64)				
		9241	2,3,4'-Trichlorobiphenyl (BZ-22)				
		9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9005	2,3,4,4',5-Pentachlorobiphenyl (BZ-114)				
		9219	2,3,4,4',6-Pentachlorobiphenyl (BZ-115)				
		9221	2,3,4,4'-Tetrachlorobiphenyl (BZ-60)				
		9225	2,3,4,5,6-Pentachlorobiphenyl (BZ-116)				
		9228	2,3,4,5-Tetrachlorobiphenyl (BZ-61)				
		9234	2,3,4,6-Tetrachlorobiphenyl (BZ-62)				
		9238	2,3,4-Trichlorobiphenyl (BZ-21)				
		9243	2,3,5,6-Tetrachlorobiphenyl (BZ-65)				
		9245	2,3,5-Trichlorobiphenyl (BZ-23)				
		9247	2,3,6-Trichlorobiphenyl (BZ-24)				
		8920	2,3-Dichlorobiphenyl (BZ-5)				
		8940	2,4',5-Trichlorobiphenyl (BZ-31)				
		9255	2,4',6-Trichlorobiphenyl (BZ-32)				
		9256	2,4'-Dichlorobiphenyl (BZ-8)				
		9250	2,4,4',5-Tetrachlorobiphenyl (BZ-74)				
		9251	2,4,4',6-Tetrachlorobiphenyl (BZ-75)				
		9252	2,4,4'-Trichlorobiphenyl (BZ-28)				
		9253	2,4,5-Trichlorobiphenyl (BZ-29)				
		9254	2,4,6-Trichlorobiphenyl (BZ-30)				
		9257	2,4-Dichlorobiphenyl (BZ-7)				
		9258	2,5-Dichlorobiphenyl (BZ-9)				
		9259	2,6-Dichlorobiphenyl (BZ-10)				
		8915	2-Chlorobiphenyl (BZ-1)				
		9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)				
		9015	3,3',4,4',5-Pentachlorobiphenyl (BZ-126)				
		8965	3,3',4,4'-Tetrachlorobiphenyl (BZ-77)				
		9261	3,3',4,5'-Tetrachlorobiphenyl (BZ-79)				
		9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9262	3,3',4,5-Tetrachlorobiphenyl (BZ-78)				
		9263	3,3',4-Trichlorobiphenyl (BZ-35)				
		9264	3,3',5,5'-Tetrachlorobiphenyl (BZ-80)				
		9265	3,3',5-Trichlorobiphenyl (BZ-36)				
		8925	3,3'-Dichlorobiphenyl (BZ-11)				
		9268	3,4',5-Trichlorobiphenyl (BZ-39)				
		9269	3,4'-Dichlorobiphenyl (BZ-13)				
		8970	3,4,4',5-Tetrachlorobiphenyl (BZ-81)				
		9266	3,4,4'-Trichlorobiphenyl (BZ-37)				
		9267	3,4,5-Trichlorobiphenyl (BZ-38)				
		9270	3,4-Dichlorobiphenyl (BZ-12)				
		9271	3,5-Dichlorobiphenyl (BZ-14)				
		9272	3-Chlorobiphenyl (BZ-2)				
		9273	4,4'-Dichlorobiphenyl (BZ-15)				
		9274	4-Chlorobiphenyl (BZ-3)				
		9105	Decachlorobiphenyl (BZ-209)				
		8914	Sum - Dichlorobiphenyls (BZ-12- + BZ-13)				
		8916	Sum - Heptachlorobiphenyls (BZ-171 + BZ-173)				
		8917	Sum - Heptachlorobiphenyls (BZ-180 + BZ-193)				
		8919	Sum - Hexachlorobiphenyls (BZ-128 + BZ-166)				
		8922	Sum - Hexachlorobiphenyls (BZ-129 + BZ-138 + BZ-163)				
		8927	Sum - Hexachlorobiphenyls (BZ-135 + BZ-151)				
		8928	Sum - Hexachlorobiphenyls (BZ-139 + BZ-140)				
		8929	Sum - Hexachlorobiphenyls (BZ-147 + BZ-149)				
		8931	Sum - Hexachlorobiphenyls (BZ-153 + BZ-168)				
		8932	Sum - Hexachlorobiphenyls (BZ-156 + BZ-157)				
		8934	Sum - Octachlorobiphenyls (BZ-198 + BZ-199)				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8936	Sum - Pentachlorobiphenyls (BZ-107 + BZ-124)				
		8938	Sum - Pentachlorobiphenyls (BZ-110 + BZ-115)				
		8941	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)				
		8943	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)				
		8947	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)				
		8948	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)				
		8949	Sum - Pentachlorobiphenyls (BZ-93 + BZ-100)				
		8951	Sum - Pentachlorobiphenyls (BZ-98 + BZ-102)				
		8954	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-71)				
		8957	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)				
		8959	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)				
		8961	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)				
		8962	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)				
		8963	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)				
		8966	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)				
		8967	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)				
		8968	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)				
		8969	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)				
		8876	Total Dichlorobiphenyls				
		8877	Total Heptachlorobiphenyls				
		8888	Total Hexachlorobiphenyls				
		8889	Total Monochlorobiphenyls				
		8891	Total Nonachlorobiphenyls				
		8892	Total Octachlorobiphenyls				

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Biological Tissue	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8896	Total Pentachlorobiphenyls				
		8893	Total Tetrachlorobiphenyls				
		8894	Total Trichlorobiphenyls				
	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		9616	1H, 1H, 2H, 2H-perfluorododecane sulfonic acid (10:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				

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Biological Tissue	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		6915	Perfluorobutanoic acid (PFBA)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6903	Perfluorododecanoic acid (PFDoA)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6901	Perfluorohexadecanoic acid (PFHxDA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6906	Perfluorononanoic acid (PFNA)				
		6916	Perfluorooctadecanoic acid (PFODA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6914	Perfluoropentanoic acid (PFPeA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
Drinking Water							
	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				

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Drinking Water	EPA 331.0			1.0	1/1/2005	10059708	Determination of Perchlorate in Drinking Water by Liquid Chromatography Electrospray Mass Spectrometry (LC/ESI/MS)
		1895	Perchlorate				
	EPA 533				2019	10091619	Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Istope Dilution Anion Exchange Soid Phase Extraction and Liquid Chromotography/Tandem Mass Spectrometry
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6915	Perfluorobutanoic acid (PFBA)				
		6905	Perfluorodecanoic acid (PFDA)				
		6903	Perfluorododecanoic acid (PFDoA)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				

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Drinking Water	EPA 533				2019	10091619	Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Istope Dilution Anion Exchange Soid Phase Extraction and Liquid Chromotography/Tandem Mass Spectrometry
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6906	Perfluorononanoic acid (PFNA)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6914	Perfluoropentanoic acid (PFPeA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
	EPA 537			1.1		10091675	Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6903	Perfluorododecanoic acid (PFDoA)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6906	Perfluorononanoic acid (PFNA)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Drinking Water	EPA 537.1			2.0	2020	10091595	Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6903	Perfluorododecanoic acid (PFDoA)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6906	Perfluorononanoic acid (PFNA)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
Non-Potable Water	EPA 1311				1992	10118806	Toxicity Characteristic Leaching Procedure
		1466	Toxicity Characteristic Leaching Procedure (TCLP)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1312				1994	10119003	Synthetic Precipitation Leaching Procedure
		1460	Synthetic Precipitation Leaching Procedure (SPLP)				
	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9438	Hpcdd, total				
		9444	Hpcdf, total				
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				
		9615	TCDF, total				
	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9371	Bis(trifluoromethane)sulfonamide				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		4846	N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6911	Perfluorobutane Sulfonate (PFBS)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6919	Perfluorobutanoate (PFBA)				
		6915	Perfluorobutanoic acid (PFBA)				
		9562	Perfluorodecane Sulfonate (PFDS)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6921	Perfluorodecanoate (PFDA)				
		6905	Perfluorodecanoic acid (PFDA)				
		6922	Perfluorododecane sulfonate (PFDoS)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6924	Perfluorododecanoate (PFDDA)				
		6903	Perfluorododecanoic acid (PFDoA)				
		6925	Perfluoroheptane sulfonate (PFHpS)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6926	Perfluoroheptanoate (PFHpA)				

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Non-Potable Water	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		6908	Perfluoroheptanoic acid (PFHpA)				
		6901	Perfluorohexadecanoic acid (PFHxDA)				
		6910	Perfluorohexane sulfonate (PFHxS)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6928	Perfluorohexanoate (PFHxA)				
		6913	Perfluorohexanoic acid (PFHxA)				
		9464	Perfluorononane sulfonate (PFNS)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6930	Perfluorononanoate (PFNA)				
		6906	Perfluorononanoic acid (PFNA)				
		6916	Perfluorooctadecanoic acid (PFODA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6909	Perfluorooctane sulfonate (PFOS)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6932	Perfluorooctanoate (PFOA)				
		6912	Perfluorooctanoic acid (PFOA)				
		6933	Perfluoropentane sulfonate (PFPeS)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6935	Perfluoropentanoate (PFPeA)				
		6914	Perfluoropentanoic acid (PFPeA)				
		9323	Perfluoropropionic acid (PFPrA)				
		6937	Perfluorotetradecanoate (PFTDA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		6941	Perfluorotridecanoate (PFTrDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6944	Perfluoroundecanoate (PFUnDA)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		6904	Perfluoroundecanoic acid (PFUnA)				
	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6915	Perfluorobutanoic acid (PFBA)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6903	Perfluorododecanoic acid (PFDoA)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6906	Perfluorononanoic acid (PFNA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6914	Perfluoropentanoic acid (PFPeA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		6904	Perfluoroundecanoic acid (PFUnA)				
	EPA 1634			Draft	2023	10123509	Determination of 6PPD-Quinone in Aqueous Matrices Using Liquid Chromatography with Tandem Mass Spectrometry (LC/MS/MS)
		6464	6PPD-quinone				
	EPA 1668A				1999	10262007	Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS
		8914	Sum - Dichlorobiphenyls (BZ-12- + BZ-13)				
		8916	Sum - Heptachlorobiphenyls (BZ-171 + BZ-173)				
		8917	Sum - Heptachlorobiphenyls (BZ-180 + BZ-193)				
		8919	Sum - Hexachlorobiphenyls (BZ-128 + BZ-166)				
		8922	Sum - Hexachlorobiphenyls (BZ-129 + BZ-138 + BZ-163)				
		8927	Sum - Hexachlorobiphenyls (BZ-135 + BZ-151)				
		8928	Sum - Hexachlorobiphenyls (BZ-139 + BZ-140)				
		8929	Sum - Hexachlorobiphenyls (BZ-147 + BZ-149)				
		8931	Sum - Hexachlorobiphenyls (BZ-153 + BZ-168)				
		8932	Sum - Hexachlorobiphenyls (BZ-156 + BZ-157)				
		8934	Sum - Octachlorobiphenyls (BZ-198 + BZ-199)				
		8936	Sum - Pentachlorobiphenyls (BZ-107 + BZ-124)				
		8938	Sum - Pentachlorobiphenyls (BZ-110 + BZ-115)				
		8941	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)				
		8943	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)				
		8947	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)				

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Non-Potable Water	EPA 1668A				1999	10262007	Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS
		8948	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)				
		8949	Sum - Pentachlorobiphenyls (BZ-93 + BZ-100)				
		8951	Sum - Pentachlorobiphenyls (BZ-98 + BZ-102)				
		8954	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-71)				
		8957	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)				
		8959	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)				
		8961	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)				
		8962	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)				
		8963	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)				
		8966	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)				
		8967	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)				
		8968	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)				
		8969	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)				
	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)				
		9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)				
		9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)				
		9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)				
		9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)				
		9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)				
		9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)				
		9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)				

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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)				
		9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)				
		9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)				
		9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)				
		9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)				
		9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)				
		9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)				
		9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)				
		9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)				
		9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)				
		9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)				
		9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)				
		9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)				
		9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)				
		9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)				
		9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)				
		9122	2,2',3,3',4-Pentachlorobiphenyl (BZ-82)				
		9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)				
		9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)				
		9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)				
		9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)				
		9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)				

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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)				
		9129	2,2',3,3',5-Pentachlorobiphenyl (BZ-83)				
		9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)				
		9131	2,2',3,3',6-Pentachlorobiphenyl (BZ-84)				
		9132	2,2',3,3'-Tetrachlorobiphenyl (BZ-40)				
		9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)				
		9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)				
		9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)				
		9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)				
		9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)				
		9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)				
		9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)				
		9155	2,2',3,4',5-Pentachlorobiphenyl (BZ-90)				
		9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)				
		9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)				
		9160	2,2',3,4',6-Pentachlorobiphenyl (BZ-91)				
		9162	2,2',3,4'-Tetrachlorobiphenyl (BZ-42)				
		9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)				
		9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)				
		9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)				
		9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)				
		9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)				
		9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)				
		9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)				
		9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)				
		9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)				
		9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)				
		9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)				
		9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)				
		8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)				
		9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)				
		9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)				
		9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)				
		9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)				
		9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)				
		9153	2,2',3,4,5-Pentachlorobiphenyl (BZ-86)				
		9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)				
		9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)				
		9158	2,2',3,4,6-Pentachlorobiphenyl (BZ-88)				
		9163	2,2',3,4-Tetrachlorobiphenyl (BZ-41)				
		9166	2,2',3,5',6-Pentachlorobiphenyl (BZ-95)				
		8945	2,2',3,5'-Tetrachlorobiphenyl (BZ-44)				
		9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)				

Oregon

Environmental Laboratory Accreditation Program

ORELAP Fields of Accreditation

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

ORELAP ID: 4040
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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)				
		9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)				
		9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)				
		9168	2,2',3,5,6-Pentachlorobiphenyl (BZ-93)				
		9169	2,2',3,5-Tetrachlorobiphenyl (BZ-43)				
		9171	2,2',3,6'-Tetrachlorobiphenyl (BZ-46)				
		9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)				
		9172	2,2',3,6-Tetrachlorobiphenyl (BZ-45)				
		9173	2,2',3-Trichlorobiphenyl (BZ-16)				
		9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)				
		9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)				
		9175	2,2',4,4',5-Pentachlorobiphenyl (BZ-99)				
		9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)				
		9177	2,2',4,4',6-Pentachlorobiphenyl (BZ-100)				
		9178	2,2',4,4'-Tetrachlorobiphenyl (BZ-47)				
		9179	2,2',4,5',6-Pentachlorobiphenyl (BZ-103)				
		8950	2,2',4,5'-Tetrachlorobiphenyl (BZ-49)				
		8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)				
		9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)				
		9181	2,2',4,5-Tetrachlorobiphenyl (BZ-48)				
		9183	2,2',4,6'-Tetrachlorobiphenyl (BZ-51)				
		9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)				

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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9184	2,2',4,6-Tetrachlorobiphenyl (BZ-50)				
		9185	2,2',4-Trichlorobiphenyl (BZ-17)				
		8955	2,2',5,5'-Tetrachlorobiphenyl (BZ-52)				
		9186	2,2',5,6'-Tetrachlorobiphenyl (BZ-53)				
		8930	2,2',5-Trichlorobiphenyl (BZ-18)				
		9187	2,2',6,6'-Tetrachlorobiphenyl (BZ-54)				
		9188	2,2',6-Trichlorobiphenyl (BZ-19)				
		9189	2,2'-Dichlorobiphenyl (BZ-4)				
		9224	2,3',4',5',6-Pentachlorobiphenyl (BZ-125)				
		9229	2,3',4',5'-Tetrachlorobiphenyl (BZ-76)				
		9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)				
		9230	2,3',4',5-Tetrachlorobiphenyl (BZ-70)				
		9237	2,3',4',6-Tetrachlorobiphenyl (BZ-71)				
		9239	2,3',4'-Trichlorobiphenyl (BZ-33)				
		9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)				
		9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)				
		9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)				
		8995	2,3',4,4',5-Pentachlorobiphenyl (BZ-118)				
		9220	2,3',4,4',6-Pentachlorobiphenyl (BZ-119)				
		8960	2,3',4,4'-Tetrachlorobiphenyl (BZ-66)				
		9226	2,3',4,5',6-Pentachlorobiphenyl (BZ-121)				
		9231	2,3',4,5'-Tetrachlorobiphenyl (BZ-68)				
		9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)				
		9232	2,3',4,5-Tetrachlorobiphenyl (BZ-67)				

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		9235	2,3',4,6-Tetrachlorobiphenyl (BZ-69)				
		9240	2,3',4-Trichlorobiphenyl (BZ-25)				
		9244	2,3',5',6-Tetrachlorobiphenyl (BZ-73)				
		9246	2,3',5'-Trichlorobiphenyl (BZ-34)				
		9242	2,3',5,5'-Tetrachlorobiphenyl (BZ-72)				
		8935	2,3',5-Trichlorobiphenyl (BZ-26)				
		9248	2,3',6-Trichlorobiphenyl (BZ-27)				
		9249	2,3'-Dichlorobiphenyl (BZ-6)				
		9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)				
		9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)				
		9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)				
		9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)				
		9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)				
		9205	2,3,3',4',5-Pentachlorobiphenyl (BZ-107)				
		8990	2,3,3',4',6-Pentachlorobiphenyl (BZ-110)				
		9207	2,3,3',4'-Tetrachlorobiphenyl (BZ-56)				
		9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)				
		9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)				
		9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)				
		9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)				
		9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)				
		9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)				
		9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)				
		8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)				

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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)				
		9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)				
		9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)				
		9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)				
		9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)				
		9204	2,3,3',4,5-Pentachlorobiphenyl (BZ-106)				
		9206	2,3,3',4,6-Pentachlorobiphenyl (BZ-109)				
		9208	2,3,3',4-Tetrachlorobiphenyl (BZ-55)				
		9212	2,3,3',5',6-Pentachlorobiphenyl (BZ-113)				
		9213	2,3,3',5'-Tetrachlorobiphenyl (BZ-58)				
		9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)				
		9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)				
		9211	2,3,3',5,6-Pentachlorobiphenyl (BZ-112)				
		9214	2,3,3',5-Tetrachlorobiphenyl (BZ-57)				
		9215	2,3,3',6-Tetrachlorobiphenyl (BZ-59)				
		9216	2,3,3'-Trichlorobiphenyl (BZ-20)				
		9227	2,3,4',5,6-Pentachlorobiphenyl (BZ-117)				
		9233	2,3,4',5-Tetrachlorobiphenyl (BZ-63)				
		9236	2,3,4',6-Tetrachlorobiphenyl (BZ-64)				
		9241	2,3,4'-Trichlorobiphenyl (BZ-22)				
		9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)				
		9005	2,3,4,4',5-Pentachlorobiphenyl (BZ-114)				
		9219	2,3,4,4',6-Pentachlorobiphenyl (BZ-115)				

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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9221	2,3,4,4'-Tetrachlorobiphenyl (BZ-60)				
		9225	2,3,4,5,6-Pentachlorobiphenyl (BZ-116)				
		9228	2,3,4,5-Tetrachlorobiphenyl (BZ-61)				
		9234	2,3,4,6-Tetrachlorobiphenyl (BZ-62)				
		9238	2,3,4-Trichlorobiphenyl (BZ-21)				
		9243	2,3,5,6-Tetrachlorobiphenyl (BZ-65)				
		9245	2,3,5-Trichlorobiphenyl (BZ-23)				
		9247	2,3,6-Trichlorobiphenyl (BZ-24)				
		8920	2,3-Dichlorobiphenyl (BZ-5)				
		8940	2,4',5-Trichlorobiphenyl (BZ-31)				
		9255	2,4',6-Trichlorobiphenyl (BZ-32)				
		9256	2,4'-Dichlorobiphenyl (BZ-8)				
		9250	2,4,4',5-Tetrachlorobiphenyl (BZ-74)				
		9251	2,4,4',6-Tetrachlorobiphenyl (BZ-75)				
		9252	2,4,4'-Trichlorobiphenyl (BZ-28)				
		9253	2,4,5-Trichlorobiphenyl (BZ-29)				
		9254	2,4,6-Trichlorobiphenyl (BZ-30)				
		9257	2,4-Dichlorobiphenyl (BZ-7)				
		9258	2,5-Dichlorobiphenyl (BZ-9)				
		9259	2,6-Dichlorobiphenyl (BZ-10)				
		8915	2-Chlorobiphenyl (BZ-1)				
		9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)				
		9015	3,3',4,4',5-Pentachlorobiphenyl (BZ-126)				
		8965	3,3',4,4'-Tetrachlorobiphenyl (BZ-77)				
		9261	3,3',4,5'-Tetrachlorobiphenyl (BZ-79)				
		9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)				
		9262	3,3',4,5-Tetrachlorobiphenyl (BZ-78)				
		9263	3,3',4-Trichlorobiphenyl (BZ-35)				

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Non-Potable Water	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9264	3,3',5,5'-Tetrachlorobiphenyl (BZ-80)				
		9265	3,3',5-Trichlorobiphenyl (BZ-36)				
		8925	3,3'-Dichlorobiphenyl (BZ-11)				
		9268	3,4',5-Trichlorobiphenyl (BZ-39)				
		9269	3,4'-Dichlorobiphenyl (BZ-13)				
		8970	3,4,4',5-Tetrachlorobiphenyl (BZ-81)				
		9266	3,4,4'-Trichlorobiphenyl (BZ-37)				
		9267	3,4,5-Trichlorobiphenyl (BZ-38)				
		9270	3,4-Dichlorobiphenyl (BZ-12)				
		9271	3,5-Dichlorobiphenyl (BZ-14)				
		9272	3-Chlorobiphenyl (BZ-2)				
		9273	4,4'-Dichlorobiphenyl (BZ-15)				
		9274	4-Chlorobiphenyl (BZ-3)				
		9105	Decachlorobiphenyl (BZ-209)				
		8876	Total Dichlorobiphenyls				
		8877	Total Heptachlorobiphenyls				
		8888	Total Hexachlorobiphenyls				
		8889	Total Monochlorobiphenyls				
		8891	Total Nonachlorobiphenyls				
		8892	Total Octachlorobiphenyls				
		8896	Total Pentachlorobiphenyls				
		8893	Total Tetrachlorobiphenyls				
		8894	Total Trichlorobiphenyls				
	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)				
		9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)				
		9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)				
		9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)				
		9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)				
		9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)				
		9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)				
		9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)				
		9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)				
		9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)				
		9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)				
		9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)				
		9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)				
		9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)				
		9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)				
		9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)				
		9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)				
		9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)				
		9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)				
		9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)				
		9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)				
		9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)				
		9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)				
		9122	2,2',3,3',4-Pentachlorobiphenyl (BZ-82)				
		9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)				
		9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)				
		9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)				

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		9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)				
		9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)				
		9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)				
		9129	2,2',3,3',5-Pentachlorobiphenyl (BZ-83)				
		9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)				
		9131	2,2',3,3',6-Pentachlorobiphenyl (BZ-84)				
		9132	2,2',3,3'-Tetrachlorobiphenyl (BZ-40)				
		9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)				
		9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)				
		9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)				
		9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)				
		9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)				
		9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)				
		9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)				
		9155	2,2',3,4',5-Pentachlorobiphenyl (BZ-90)				
		9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)				
		9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)				
		9160	2,2',3,4',6-Pentachlorobiphenyl (BZ-91)				
		9162	2,2',3,4'-Tetrachlorobiphenyl (BZ-42)				
		9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)				
		9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)				
		9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)				
		9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)				
		9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)				
		9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)				
		9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)				
		9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)				
		9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)				
		9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)				
		9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)				
		9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)				
		8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)				
		9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)				
		9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)				
		9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)				
		9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)				
		9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)				
		9153	2,2',3,4,5-Pentachlorobiphenyl (BZ-86)				
		9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)				
		9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)				
		9158	2,2',3,4,6-Pentachlorobiphenyl (BZ-88)				
		9163	2,2',3,4-Tetrachlorobiphenyl (BZ-41)				
		9166	2,2',3,5',6-Pentachlorobiphenyl (BZ-95)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8945	2,2',3,5'-Tetrachlorobiphenyl (BZ-44)				
		9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)				
		9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)				
		9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)				
		9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)				
		9168	2,2',3,5,6-Pentachlorobiphenyl (BZ-93)				
		9169	2,2',3,5-Tetrachlorobiphenyl (BZ-43)				
		9171	2,2',3,6'-Tetrachlorobiphenyl (BZ-46)				
		9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)				
		9172	2,2',3,6-Tetrachlorobiphenyl (BZ-45)				
		9173	2,2',3-Trichlorobiphenyl (BZ-16)				
		9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)				
		9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)				
		9175	2,2',4,4',5-Pentachlorobiphenyl (BZ-99)				
		9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)				
		9177	2,2',4,4',6-Pentachlorobiphenyl (BZ-100)				
		9178	2,2',4,4'-Tetrachlorobiphenyl (BZ-47)				
		9179	2,2',4,5',6-Pentachlorobiphenyl (BZ-103)				
		8950	2,2',4,5'-Tetrachlorobiphenyl (BZ-49)				
		8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)				
		9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)				
		9181	2,2',4,5-Tetrachlorobiphenyl (BZ-48)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9183	2,2',4,6'-Tetrachlorobiphenyl (BZ-51)				
		9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)				
		9184	2,2',4,6-Tetrachlorobiphenyl (BZ-50)				
		9185	2,2',4-Trichlorobiphenyl (BZ-17)				
		8955	2,2',5,5'-Tetrachlorobiphenyl (BZ-52)				
		9186	2,2',5,6'-Tetrachlorobiphenyl (BZ-53)				
		8930	2,2',5-Trichlorobiphenyl (BZ-18)				
		9187	2,2',6,6'-Tetrachlorobiphenyl (BZ-54)				
		9188	2,2',6-Trichlorobiphenyl (BZ-19)				
		9189	2,2'-Dichlorobiphenyl (BZ-4)				
		9224	2,3',4',5',6-Pentachlorobiphenyl (BZ-125)				
		9229	2,3',4',5'-Tetrachlorobiphenyl (BZ-76)				
		9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)				
		9230	2,3',4',5-Tetrachlorobiphenyl (BZ-70)				
		9237	2,3',4',6-Tetrachlorobiphenyl (BZ-71)				
		9239	2,3',4'-Trichlorobiphenyl (BZ-33)				
		9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)				
		9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)				
		9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)				
		8995	2,3',4,4',5-Pentachlorobiphenyl (BZ-118)				
		9220	2,3',4,4',6-Pentachlorobiphenyl (BZ-119)				
		8960	2,3',4,4'-Tetrachlorobiphenyl (BZ-66)				
		9226	2,3',4,5',6-Pentachlorobiphenyl (BZ-121)				
		9231	2,3',4,5'-Tetrachlorobiphenyl (BZ-68)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)				
		9232	2,3',4,5-Tetrachlorobiphenyl (BZ-67)				
		9235	2,3',4,6-Tetrachlorobiphenyl (BZ-69)				
		9240	2,3',4-Trichlorobiphenyl (BZ-25)				
		9244	2,3',5',6-Tetrachlorobiphenyl (BZ-73)				
		9246	2,3',5'-Trichlorobiphenyl (BZ-34)				
		9242	2,3',5,5'-Tetrachlorobiphenyl (BZ-72)				
		8935	2,3',5-Trichlorobiphenyl (BZ-26)				
		9248	2,3',6-Trichlorobiphenyl (BZ-27)				
		9249	2,3'-Dichlorobiphenyl (BZ-6)				
		9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)				
		9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)				
		9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)				
		9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)				
		9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)				
		9205	2,3,3',4',5-Pentachlorobiphenyl (BZ-107)				
		8990	2,3,3',4',6-Pentachlorobiphenyl (BZ-110)				
		9207	2,3,3',4'-Tetrachlorobiphenyl (BZ-56)				
		9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)				
		9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)				
		9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)				
		9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)				
		9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)				
		9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)				
		8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)				
		9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)				
		9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)				
		9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)				
		9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)				
		9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)				
		9204	2,3,3',4,5-Pentachlorobiphenyl (BZ-106)				
		9206	2,3,3',4,6-Pentachlorobiphenyl (BZ-109)				
		9208	2,3,3',4-Tetrachlorobiphenyl (BZ-55)				
		9212	2,3,3',5',6-Pentachlorobiphenyl (BZ-113)				
		9213	2,3,3',5'-Tetrachlorobiphenyl (BZ-58)				
		9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)				
		9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)				
		9211	2,3,3',5,6-Pentachlorobiphenyl (BZ-112)				
		9214	2,3,3',5-Tetrachlorobiphenyl (BZ-57)				
		9215	2,3,3',6-Tetrachlorobiphenyl (BZ-59)				
		9216	2,3,3'-Trichlorobiphenyl (BZ-20)				
		9227	2,3,4',5,6-Pentachlorobiphenyl (BZ-117)				
		9233	2,3,4',5-Tetrachlorobiphenyl (BZ-63)				
		9236	2,3,4',6-Tetrachlorobiphenyl (BZ-64)				
		9241	2,3,4'-Trichlorobiphenyl (BZ-22)				
		9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9005	2,3,4,4',5-Pentachlorobiphenyl (BZ-114)				
		9219	2,3,4,4',6-Pentachlorobiphenyl (BZ-115)				
		9221	2,3,4,4'-Tetrachlorobiphenyl (BZ-60)				
		9225	2,3,4,5,6-Pentachlorobiphenyl (BZ-116)				
		9228	2,3,4,5-Tetrachlorobiphenyl (BZ-61)				
		9234	2,3,4,6-Tetrachlorobiphenyl (BZ-62)				
		9238	2,3,4-Trichlorobiphenyl (BZ-21)				
		9243	2,3,5,6-Tetrachlorobiphenyl (BZ-65)				
		9245	2,3,5-Trichlorobiphenyl (BZ-23)				
		9247	2,3,6-Trichlorobiphenyl (BZ-24)				
		8920	2,3-Dichlorobiphenyl (BZ-5)				
		8940	2,4',5-Trichlorobiphenyl (BZ-31)				
		9255	2,4',6-Trichlorobiphenyl (BZ-32)				
		9256	2,4'-Dichlorobiphenyl (BZ-8)				
		9250	2,4,4',5-Tetrachlorobiphenyl (BZ-74)				
		9251	2,4,4',6-Tetrachlorobiphenyl (BZ-75)				
		9252	2,4,4'-Trichlorobiphenyl (BZ-28)				
		9253	2,4,5-Trichlorobiphenyl (BZ-29)				
		9254	2,4,6-Trichlorobiphenyl (BZ-30)				
		9257	2,4-Dichlorobiphenyl (BZ-7)				
		9258	2,5-Dichlorobiphenyl (BZ-9)				
		9259	2,6-Dichlorobiphenyl (BZ-10)				
		8915	2-Chlorobiphenyl (BZ-1)				
		9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)				
		9015	3,3',4,4',5-Pentachlorobiphenyl (BZ-126)				
		8965	3,3',4,4'-Tetrachlorobiphenyl (BZ-77)				
		9261	3,3',4,5'-Tetrachlorobiphenyl (BZ-79)				
		9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9262	3,3',4,5-Tetrachlorobiphenyl (BZ-78)				
		9263	3,3',4-Trichlorobiphenyl (BZ-35)				
		9264	3,3',5,5'-Tetrachlorobiphenyl (BZ-80)				
		9265	3,3',5-Trichlorobiphenyl (BZ-36)				
		8925	3,3'-Dichlorobiphenyl (BZ-11)				
		9268	3,4',5-Trichlorobiphenyl (BZ-39)				
		9269	3,4'-Dichlorobiphenyl (BZ-13)				
		8970	3,4,4',5-Tetrachlorobiphenyl (BZ-81)				
		9266	3,4,4'-Trichlorobiphenyl (BZ-37)				
		9267	3,4,5-Trichlorobiphenyl (BZ-38)				
		9270	3,4-Dichlorobiphenyl (BZ-12)				
		9271	3,5-Dichlorobiphenyl (BZ-14)				
		9272	3-Chlorobiphenyl (BZ-2)				
		9273	4,4'-Dichlorobiphenyl (BZ-15)				
		9274	4-Chlorobiphenyl (BZ-3)				
		9105	Decachlorobiphenyl (BZ-209)				
		8914	Sum - Dichlorobiphenyls (BZ-12- + BZ-13)				
		8916	Sum - Heptachlorobiphenyls (BZ-171 + BZ-173)				
		8917	Sum - Heptachlorobiphenyls (BZ-180 + BZ-193)				
		8919	Sum - Hexachlorobiphenyls (BZ-128 + BZ-166)				
		8922	Sum - Hexachlorobiphenyls (BZ-129 + BZ-138 + BZ-163)				
		8927	Sum - Hexachlorobiphenyls (BZ-135 + BZ-151)				
		8928	Sum - Hexachlorobiphenyls (BZ-139 + BZ-140)				
		8929	Sum - Hexachlorobiphenyls (BZ-147 + BZ-149)				
		8931	Sum - Hexachlorobiphenyls (BZ-153 + BZ-168)				
		8932	Sum - Hexachlorobiphenyls (BZ-156 + BZ-157)				
		8934	Sum - Octachlorobiphenyls (BZ-198 + BZ-199)				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8936	Sum - Pentachlorobiphenyls (BZ-107 + BZ-124)				
		8938	Sum - Pentachlorobiphenyls (BZ-110 + BZ-115)				
		8941	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)				
		8943	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)				
		8947	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)				
		8948	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)				
		8949	Sum - Pentachlorobiphenyls (BZ-93 + BZ-100)				
		8951	Sum - Pentachlorobiphenyls (BZ-98 + BZ-102)				
		8954	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-71)				
		8957	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)				
		8959	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)				
		8961	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)				
		8962	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)				
		8963	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)				
		8966	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)				
		8967	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)				
		8968	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)				
		8969	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)				
		8876	Total Dichlorobiphenyls				
		8877	Total Heptachlorobiphenyls				
		8888	Total Hexachlorobiphenyls				
		8889	Total Monochlorobiphenyls				
		8891	Total Nonachlorobiphenyls				
		8892	Total Octachlorobiphenyls				

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Non-Potable Water	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8896	Total Pentachlorobiphenyls				
		8893	Total Tetrachlorobiphenyls				
		8894	Total Trichlorobiphenyls				
	EPA 300.0			2.1	1993	10053200	Methods for the Determination of Inorganic Substances in Environmental Samples
		1730	Fluoride				
	EPA 3510C				1996	10138202	Separatory Funnel Liquid-liquid extraction
		1444	Seperatory Funnel Liquid-Liquid Extraction				
	EPA 3535				1996	10139205	Solid-Phase Extraction (SPE)
		1448	Solid-Phase Extraction				
	EPA 3580A				1992	10143007	Waste Dilution
		1470	Waste Dilution				
	EPA 6850				2007	10304606	Perchlorate in Water, Soils and Solid Wastes Using High Performance Liquid Chromatography/Electrospray Ionization/Mass Spectrometry
		1895	Perchlorate				
	EPA 8290				1994	10187209	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				

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Non-Potable Water	EPA 8290				1994	10187209	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				
		9438	Hpcdd, total				
		9444	Hpcdf, total				
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				
		9615	TCDF, total				
	EPA 8290A				1998	10187403	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 8290A				1998	10187403	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				
		9438	Hpcdd, total				
		9444	Hpcdf, total				
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				
		9615	TCDF, total				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	EPA 9040B				1995	10197203	pH Electrometric Measurement
		1900	pH				
	EPA 9040C				2002	10244403	pH Electrometric Measurement
		1900	pH				
	EPA 9056				1994	10199209	Determination of Inorganic Anions by Ion Chromatography
		1730	Fluoride				
	EPA 9056A				2000	10199607	Determination of Inorganic Anions by Ion Chromatography
		1730	Fluoride				
	SM 2540 C-97			1997	1997	20050402	Total Dissolved Solids Dried at 180C
		1955	Residue-filterable (TDS)				
	SM 2540 D-97			1997		20051201	Total Suspended Solids Dried at 103 - 105C
		1960	Residue-nonfilterable (TSS)				
	SM 4500-H+ B-2000			online		20105219	pH Value by Electrometric Method .
		1900	pH				
	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9281	1,1,2,2-Tetrafluoro-2-(1,2,2,2-tetrafluoroethoxy)ethane-1-sulfonic acid (NVHOS)				
		9282	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy] ethanesulfonic acid (R-PSDCA)				
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		9616	1H, 1H, 2H, 2H-perfluorododecane sulfonic acid (10:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				

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Non-Potable Water	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9283	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)				
		9284	2,2-Difluoro-2-(trifluoromethoxy) Acetic acid (PFMOAA)				
		9285	2-Perfluorodecylethanoic acid (10:2 FTCA)				
		9286	2-Perfluorohexylethanoic acid (6:2 FTCA)				
		9316	2-Perfluorooctyl ethanoic acid (FOEA)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		9287	4-(2-carboxy-1,1,2,2-tetrafluoroethoxy)-2,2,3,3,4,5,5,5-octafluoro-pentanoic acid (R-EVE)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		9288	Perfluoro-2-{[perfluoro-3-(perfluoroethoxy)-2-propanyl]oxy}ethanesulfonic acid (Hydro-PS Acid)				
		9289	Perfluoro-2-ethoxypropanoic acid (PEPA)				
		9290	Perfluoro-2-methoxypropanoic acid (PMPA)				
		9291	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DoA)				
		9293	Perfluoro-3,5,7,9-butaoxadecanoic acid (PFO4DA)				
		9294	Perfluoro-3,5,7-trioxaoctanoic acid (PFO3OA)				
		9295	Perfluoro-3,5-dioxahexanoic acid (PFO2HxA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		9296	Perfluoro-4-ethylcyclohexanesulfonic acid (PFecHS)				
		9298	Perfluoro-4-isopropoxybutanoic acid (PFPE-1)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6915	Perfluorobutanoic acid (PFBA)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6903	Perfluorododecanoic acid (PFDoA)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Non-Potable Water	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6901	Perfluorohexadecanoic acid (PFHxDA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6906	Perfluorononanoic acid (PFNA)				
		6916	Perfluorooctadecanoic acid (PFODA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6914	Perfluoropentanoic acid (PFPeA)				
		9320	Perfluoropropanesulfonic acid (PFPrS)				
		9323	Perfluoropropionic acid (PFPrA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
	WS-MS-0011			2014		60055529	TestAmerica West Sacramento - 1,4-Dioxane by GC/MS SIM
		4735	1,4-Dioxane (1,4-Diethyleneoxide)				
	WS-MS-0012			2014		60055530	TestAmerica West Sacramento - Nitrosamines by GC/MS/MS with LVI
		6545	n-Nitrosodi-n-propylamine				
		6525	n-Nitrosodiethylamine				
		6530	n-Nitrosodimethylamine				
		6565	n-Nitrosopyrrolidine				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Solids							
	EPA 1311				1992	10118806	Toxicity Characteristic Leaching Procedure
		1466	Toxicity Characteristic Leaching Procedure (TCLP)				
	EPA 1312				1994	10119003	Synthetic Precipitation Leaching Procedure
		1460	Synthetic Precipitation Leaching Procedure (SPLP)				
	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				

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Solids	EPA 1613B					10120602	Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				
		9438	Hpcdd, total				
		9444	Hpcdf, total				
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				
		9615	TCDF, total				
	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9371	Bis(trifluoromethane)sulfonamide				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				

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Solids	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6911	Perfluorobutane Sulfonate (PFBS)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6919	Perfluorobutanoate (PFBA)				
		6915	Perfluorobutanoic acid (PFBA)				
		9562	Perfluorodecane Sulfonate (PFDS)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6921	Perfluorodecanoate (PFDA)				
		6905	Perfluorodecanoic acid (PFDA)				
		6922	Perfluorododecane sulfonate (PFDoS)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6924	Perfluorododecanoate (PFDDA)				
		6903	Perfluorododecanoic acid (PFDoA)				

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Solids	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		6925	Perfluoroheptane sulfonate (PFHpS)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6926	Perfluoroheptanoate (PFHpA)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6901	Perfluorohexadecanoic acid (PFHxDA)				
		6910	Perfluorohexane sulfonate (PFHxS)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6928	Perfluorohexanoate (PFHxA)				
		6913	Perfluorohexanoic acid (PFHxA)				
		9464	Perfluorononane sulfonate (PFNS)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6930	Perfluorononanoate (PFNA)				
		6906	Perfluorononanoic acid (PFNA)				
		6916	Perfluorooctadecanoic acid (PFODA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6909	Perfluorooctane sulfonate (PFOS)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6932	Perfluorooctanoate (PFOA)				
		6912	Perfluorooctanoic acid (PFOA)				
		6933	Perfluoropentane sulfonate (PFPeS)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6935	Perfluoropentanoate (PFPeA)				
		6914	Perfluoropentanoic acid (PFPeA)				
		9323	Perfluoropropionic acid (PFPrA)				
		6937	Perfluorotetradecanoate (PFTDA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				

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Solids	EPA 1633				January 2024	10123463	Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS
		6941	Perfluorotridecanoate (PFTrDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6944	Perfluoroundecanoate (PFUnDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				

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Solids	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6915	Perfluorobutanoic acid (PFBA)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6903	Perfluorododecanoic acid (PFDoA)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				
		6929	Perfluorononane sulfonic acid (PFNS)				
		6906	Perfluorononanoic acid (PFNA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				

MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Solids	EPA 1633 Draft 3				2022	10123441	Analysis Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS by LC/MS/MS
		6914	Perfluoropentanoic acid (PFPeA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
	EPA 1668A				1999	10262007	Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS
		8914	Sum - Dichlorobiphenyls (BZ-12- + BZ-13)				
		8916	Sum - Heptachlorobiphenyls (BZ-171 + BZ-173)				
		8917	Sum - Heptachlorobiphenyls (BZ-180 + BZ-193)				
		8919	Sum - Hexachlorobiphenyls (BZ-128 + BZ-166)				
		8922	Sum - Hexachlorobiphenyls (BZ-129 + BZ-138 + BZ-163)				
		8927	Sum - Hexachlorobiphenyls (BZ-135 + BZ-151)				
		8928	Sum - Hexachlorobiphenyls (BZ-139 + BZ-140)				
		8929	Sum - Hexachlorobiphenyls (BZ-147 + BZ-149)				
		8931	Sum - Hexachlorobiphenyls (BZ-153 + BZ-168)				
		8932	Sum - Hexachlorobiphenyls (BZ-156 + BZ-157)				
		8934	Sum - Octachlorobiphenyls (BZ-198 + BZ-199)				
		8936	Sum - Pentachlorobiphenyls (BZ-107 + BZ-124)				
		8938	Sum - Pentachlorobiphenyls (BZ-110 + BZ-115)				
		8941	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)				
		8943	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)				
		8947	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)				

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Solids	EPA 1668A				1999	10262007	Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS
		8948	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)				
		8949	Sum - Pentachlorobiphenyls (BZ-93 + BZ-100)				
		8951	Sum - Pentachlorobiphenyls (BZ-98 + BZ-102)				
		8954	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-71)				
		8957	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)				
		8959	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)				
		8961	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)				
		8962	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)				
		8963	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)				
		8966	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)				
		8967	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)				
		8968	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)				
		8969	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)				
	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)				
		9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)				
		9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)				
		9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)				
		9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)				
		9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)				
		9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)				
		9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)				
		9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)				
		9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)				
		9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)				
		9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)				
		9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)				
		9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)				
		9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)				
		9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)				
		9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)				
		9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)				
		9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)				
		9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)				
		9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)				
		9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)				
		9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)				
		9122	2,2',3,3',4-Pentachlorobiphenyl (BZ-82)				
		9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)				
		9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)				
		9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)				
		9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)				
		9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)				
		9129	2,2',3,3',5-Pentachlorobiphenyl (BZ-83)				
		9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)				
		9131	2,2',3,3',6-Pentachlorobiphenyl (BZ-84)				
		9132	2,2',3,3'-Tetrachlorobiphenyl (BZ-40)				
		9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)				
		9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)				
		9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)				
		9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)				
		9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)				
		9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)				
		9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)				
		9155	2,2',3,4',5-Pentachlorobiphenyl (BZ-90)				
		9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)				
		9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)				
		9160	2,2',3,4',6-Pentachlorobiphenyl (BZ-91)				
		9162	2,2',3,4'-Tetrachlorobiphenyl (BZ-42)				
		9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)				
		9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)				
		9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)				
		9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)				
		9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)				
		9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)				
		9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)				
		9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)				
		9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)				
		9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)				
		9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)				
		9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)				
		8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)				
		9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)				
		9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)				
		9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)				
		9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)				
		9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)				
		9153	2,2',3,4,5-Pentachlorobiphenyl (BZ-86)				
		9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)				
		9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)				
		9158	2,2',3,4,6-Pentachlorobiphenyl (BZ-88)				
		9163	2,2',3,4-Tetrachlorobiphenyl (BZ-41)				
		9166	2,2',3,5',6-Pentachlorobiphenyl (BZ-95)				
		8945	2,2',3,5'-Tetrachlorobiphenyl (BZ-44)				
		9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)				
		9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)				
		9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)				
		9168	2,2',3,5,6-Pentachlorobiphenyl (BZ-93)				
		9169	2,2',3,5-Tetrachlorobiphenyl (BZ-43)				
		9171	2,2',3,6'-Tetrachlorobiphenyl (BZ-46)				
		9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)				
		9172	2,2',3,6-Tetrachlorobiphenyl (BZ-45)				
		9173	2,2',3-Trichlorobiphenyl (BZ-16)				
		9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)				
		9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)				
		9175	2,2',4,4',5-Pentachlorobiphenyl (BZ-99)				
		9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)				
		9177	2,2',4,4',6-Pentachlorobiphenyl (BZ-100)				
		9178	2,2',4,4'-Tetrachlorobiphenyl (BZ-47)				
		9179	2,2',4,5',6-Pentachlorobiphenyl (BZ-103)				
		8950	2,2',4,5'-Tetrachlorobiphenyl (BZ-49)				
		8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)				
		9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)				
		9181	2,2',4,5-Tetrachlorobiphenyl (BZ-48)				
		9183	2,2',4,6'-Tetrachlorobiphenyl (BZ-51)				
		9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9184	2,2',4,6-Tetrachlorobiphenyl (BZ-50)				
		9185	2,2',4-Trichlorobiphenyl (BZ-17)				
		8955	2,2',5,5'-Tetrachlorobiphenyl (BZ-52)				
		9186	2,2',5,6'-Tetrachlorobiphenyl (BZ-53)				
		8930	2,2',5-Trichlorobiphenyl (BZ-18)				
		9187	2,2',6,6'-Tetrachlorobiphenyl (BZ-54)				
		9188	2,2',6-Trichlorobiphenyl (BZ-19)				
		9189	2,2'-Dichlorobiphenyl (BZ-4)				
		9224	2,3',4',5',6-Pentachlorobiphenyl (BZ-125)				
		9229	2,3',4',5'-Tetrachlorobiphenyl (BZ-76)				
		9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)				
		9230	2,3',4',5-Tetrachlorobiphenyl (BZ-70)				
		9237	2,3',4',6-Tetrachlorobiphenyl (BZ-71)				
		9239	2,3',4'-Trichlorobiphenyl (BZ-33)				
		9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)				
		9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)				
		9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)				
		8995	2,3',4,4',5-Pentachlorobiphenyl (BZ-118)				
		9220	2,3',4,4',6-Pentachlorobiphenyl (BZ-119)				
		8960	2,3',4,4'-Tetrachlorobiphenyl (BZ-66)				
		9226	2,3',4,5',6-Pentachlorobiphenyl (BZ-121)				
		9231	2,3',4,5'-Tetrachlorobiphenyl (BZ-68)				
		9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)				
		9232	2,3',4,5-Tetrachlorobiphenyl (BZ-67)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9235	2,3',4,6-Tetrachlorobiphenyl (BZ-69)				
		9240	2,3',4-Trichlorobiphenyl (BZ-25)				
		9244	2,3',5',6-Tetrachlorobiphenyl (BZ-73)				
		9246	2,3',5'-Trichlorobiphenyl (BZ-34)				
		9242	2,3',5,5'-Tetrachlorobiphenyl (BZ-72)				
		8935	2,3',5-Trichlorobiphenyl (BZ-26)				
		9248	2,3',6-Trichlorobiphenyl (BZ-27)				
		9249	2,3'-Dichlorobiphenyl (BZ-6)				
		9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)				
		9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)				
		9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)				
		9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)				
		9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)				
		9205	2,3,3',4',5-Pentachlorobiphenyl (BZ-107)				
		8990	2,3,3',4',6-Pentachlorobiphenyl (BZ-110)				
		9207	2,3,3',4'-Tetrachlorobiphenyl (BZ-56)				
		9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)				
		9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)				
		9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)				
		9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)				
		9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)				
		9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)				
		9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)				
		8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)				

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		9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)				
		9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)				
		9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)				
		9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)				
		9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)				
		9204	2,3,3',4,5-Pentachlorobiphenyl (BZ-106)				
		9206	2,3,3',4,6-Pentachlorobiphenyl (BZ-109)				
		9208	2,3,3',4-Tetrachlorobiphenyl (BZ-55)				
		9212	2,3,3',5',6-Pentachlorobiphenyl (BZ-113)				
		9213	2,3,3',5'-Tetrachlorobiphenyl (BZ-58)				
		9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)				
		9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)				
		9211	2,3,3',5,6-Pentachlorobiphenyl (BZ-112)				
		9214	2,3,3',5-Tetrachlorobiphenyl (BZ-57)				
		9215	2,3,3',6-Tetrachlorobiphenyl (BZ-59)				
		9216	2,3,3'-Trichlorobiphenyl (BZ-20)				
		9227	2,3,4',5,6-Pentachlorobiphenyl (BZ-117)				
		9233	2,3,4',5-Tetrachlorobiphenyl (BZ-63)				
		9236	2,3,4',6-Tetrachlorobiphenyl (BZ-64)				
		9241	2,3,4'-Trichlorobiphenyl (BZ-22)				
		9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)				
		9005	2,3,4,4',5-Pentachlorobiphenyl (BZ-114)				
		9219	2,3,4,4',6-Pentachlorobiphenyl (BZ-115)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9221	2,3,4,4'-Tetrachlorobiphenyl (BZ-60)				
		9225	2,3,4,5,6-Pentachlorobiphenyl (BZ-116)				
		9228	2,3,4,5-Tetrachlorobiphenyl (BZ-61)				
		9234	2,3,4,6-Tetrachlorobiphenyl (BZ-62)				
		9238	2,3,4-Trichlorobiphenyl (BZ-21)				
		9243	2,3,5,6-Tetrachlorobiphenyl (BZ-65)				
		9245	2,3,5-Trichlorobiphenyl (BZ-23)				
		9247	2,3,6-Trichlorobiphenyl (BZ-24)				
		8920	2,3-Dichlorobiphenyl (BZ-5)				
		8940	2,4',5-Trichlorobiphenyl (BZ-31)				
		9255	2,4',6-Trichlorobiphenyl (BZ-32)				
		9256	2,4'-Dichlorobiphenyl (BZ-8)				
		9250	2,4,4',5-Tetrachlorobiphenyl (BZ-74)				
		9251	2,4,4',6-Tetrachlorobiphenyl (BZ-75)				
		9252	2,4,4'-Trichlorobiphenyl (BZ-28)				
		9253	2,4,5-Trichlorobiphenyl (BZ-29)				
		9254	2,4,6-Trichlorobiphenyl (BZ-30)				
		9257	2,4-Dichlorobiphenyl (BZ-7)				
		9258	2,5-Dichlorobiphenyl (BZ-9)				
		9259	2,6-Dichlorobiphenyl (BZ-10)				
		8915	2-Chlorobiphenyl (BZ-1)				
		9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)				
		9015	3,3',4,4',5-Pentachlorobiphenyl (BZ-126)				
		8965	3,3',4,4'-Tetrachlorobiphenyl (BZ-77)				
		9261	3,3',4,5'-Tetrachlorobiphenyl (BZ-79)				
		9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)				
		9262	3,3',4,5-Tetrachlorobiphenyl (BZ-78)				
		9263	3,3',4-Trichlorobiphenyl (BZ-35)				

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Solids	EPA 1668A				2003	10262029	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9264	3,3',5,5'-Tetrachlorobiphenyl (BZ-80)				
		9265	3,3',5-Trichlorobiphenyl (BZ-36)				
		8925	3,3'-Dichlorobiphenyl (BZ-11)				
		9268	3,4',5-Trichlorobiphenyl (BZ-39)				
		9269	3,4'-Dichlorobiphenyl (BZ-13)				
		8970	3,4,4',5-Tetrachlorobiphenyl (BZ-81)				
		9266	3,4,4'-Trichlorobiphenyl (BZ-37)				
		9267	3,4,5-Trichlorobiphenyl (BZ-38)				
		9270	3,4-Dichlorobiphenyl (BZ-12)				
		9271	3,5-Dichlorobiphenyl (BZ-14)				
		9272	3-Chlorobiphenyl (BZ-2)				
		9273	4,4'-Dichlorobiphenyl (BZ-15)				
		9274	4-Chlorobiphenyl (BZ-3)				
		9105	Decachlorobiphenyl (BZ-209)				
		8876	Total Dichlorobiphenyls				
		8877	Total Heptachlorobiphenyls				
		8888	Total Hexachlorobiphenyls				
		8889	Total Monochlorobiphenyls				
		8891	Total Nonachlorobiphenyls				
		8892	Total Octachlorobiphenyls				
		8896	Total Pentachlorobiphenyls				
		8893	Total Tetrachlorobiphenyls				
		8894	Total Trichlorobiphenyls				
	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)				
		9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)				
		9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)				
		9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)				
		9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)				
		9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)				
		9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)				
		9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)				
		9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)				
		9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)				
		9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)				
		9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)				
		9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)				
		9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)				
		9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)				
		9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)				
		9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)				
		9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)				
		9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)				
		9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)				
		9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)				
		9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)				
		9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)				
		9122	2,2',3,3',4-Pentachlorobiphenyl (BZ-82)				
		9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)				
		9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)				
		9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)				
		9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)				
		9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)				
		9129	2,2',3,3',5-Pentachlorobiphenyl (BZ-83)				
		9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)				
		9131	2,2',3,3',6-Pentachlorobiphenyl (BZ-84)				
		9132	2,2',3,3'-Tetrachlorobiphenyl (BZ-40)				
		9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)				
		9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)				
		9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)				
		9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)				
		9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)				
		9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)				
		9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)				
		9155	2,2',3,4',5-Pentachlorobiphenyl (BZ-90)				
		9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)				
		9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)				
		9160	2,2',3,4',6-Pentachlorobiphenyl (BZ-91)				
		9162	2,2',3,4'-Tetrachlorobiphenyl (BZ-42)				
		9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)				
		9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)				
		9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)				
		9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)				
		9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)				
		9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)				
		9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)				
		9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)				
		9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)				
		9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)				
		9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)				
		9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)				
		8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)				
		9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)				
		9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)				
		9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)				
		9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)				
		9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)				
		9153	2,2',3,4,5-Pentachlorobiphenyl (BZ-86)				
		9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)				
		9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)				
		9158	2,2',3,4,6-Pentachlorobiphenyl (BZ-88)				
		9163	2,2',3,4-Tetrachlorobiphenyl (BZ-41)				
		9166	2,2',3,5',6-Pentachlorobiphenyl (BZ-95)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8945	2,2',3,5'-Tetrachlorobiphenyl (BZ-44)				
		9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)				
		9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)				
		9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)				
		9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)				
		9168	2,2',3,5,6-Pentachlorobiphenyl (BZ-93)				
		9169	2,2',3,5-Tetrachlorobiphenyl (BZ-43)				
		9171	2,2',3,6'-Tetrachlorobiphenyl (BZ-46)				
		9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)				
		9172	2,2',3,6-Tetrachlorobiphenyl (BZ-45)				
		9173	2,2',3-Trichlorobiphenyl (BZ-16)				
		9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)				
		9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)				
		9175	2,2',4,4',5-Pentachlorobiphenyl (BZ-99)				
		9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)				
		9177	2,2',4,4',6-Pentachlorobiphenyl (BZ-100)				
		9178	2,2',4,4'-Tetrachlorobiphenyl (BZ-47)				
		9179	2,2',4,5',6-Pentachlorobiphenyl (BZ-103)				
		8950	2,2',4,5'-Tetrachlorobiphenyl (BZ-49)				
		8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)				
		9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)				
		9181	2,2',4,5-Tetrachlorobiphenyl (BZ-48)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9183	2,2',4,6'-Tetrachlorobiphenyl (BZ-51)				
		9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)				
		9184	2,2',4,6-Tetrachlorobiphenyl (BZ-50)				
		9185	2,2',4-Trichlorobiphenyl (BZ-17)				
		8955	2,2',5,5'-Tetrachlorobiphenyl (BZ-52)				
		9186	2,2',5,6'-Tetrachlorobiphenyl (BZ-53)				
		8930	2,2',5-Trichlorobiphenyl (BZ-18)				
		9187	2,2',6,6'-Tetrachlorobiphenyl (BZ-54)				
		9188	2,2',6-Trichlorobiphenyl (BZ-19)				
		9189	2,2'-Dichlorobiphenyl (BZ-4)				
		9224	2,3',4',5',6-Pentachlorobiphenyl (BZ-125)				
		9229	2,3',4',5'-Tetrachlorobiphenyl (BZ-76)				
		9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)				
		9230	2,3',4',5-Tetrachlorobiphenyl (BZ-70)				
		9237	2,3',4',6-Tetrachlorobiphenyl (BZ-71)				
		9239	2,3',4'-Trichlorobiphenyl (BZ-33)				
		9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)				
		9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)				
		9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)				
		8995	2,3',4,4',5-Pentachlorobiphenyl (BZ-118)				
		9220	2,3',4,4',6-Pentachlorobiphenyl (BZ-119)				
		8960	2,3',4,4'-Tetrachlorobiphenyl (BZ-66)				
		9226	2,3',4,5',6-Pentachlorobiphenyl (BZ-121)				
		9231	2,3',4,5'-Tetrachlorobiphenyl (BZ-68)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)				
		9232	2,3',4,5-Tetrachlorobiphenyl (BZ-67)				
		9235	2,3',4,6-Tetrachlorobiphenyl (BZ-69)				
		9240	2,3',4-Trichlorobiphenyl (BZ-25)				
		9244	2,3',5',6-Tetrachlorobiphenyl (BZ-73)				
		9246	2,3',5'-Trichlorobiphenyl (BZ-34)				
		9242	2,3',5,5'-Tetrachlorobiphenyl (BZ-72)				
		8935	2,3',5-Trichlorobiphenyl (BZ-26)				
		9248	2,3',6-Trichlorobiphenyl (BZ-27)				
		9249	2,3'-Dichlorobiphenyl (BZ-6)				
		9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)				
		9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)				
		9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)				
		9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)				
		9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)				
		9205	2,3,3',4',5-Pentachlorobiphenyl (BZ-107)				
		8990	2,3,3',4',6-Pentachlorobiphenyl (BZ-110)				
		9207	2,3,3',4'-Tetrachlorobiphenyl (BZ-56)				
		9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)				
		9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)				
		9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)				
		9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)				
		9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)				
		9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)				
		8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)				
		9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)				
		9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)				
		9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)				
		9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)				
		9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)				
		9204	2,3,3',4,5-Pentachlorobiphenyl (BZ-106)				
		9206	2,3,3',4,6-Pentachlorobiphenyl (BZ-109)				
		9208	2,3,3',4-Tetrachlorobiphenyl (BZ-55)				
		9212	2,3,3',5',6-Pentachlorobiphenyl (BZ-113)				
		9213	2,3,3',5'-Tetrachlorobiphenyl (BZ-58)				
		9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)				
		9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)				
		9211	2,3,3',5,6-Pentachlorobiphenyl (BZ-112)				
		9214	2,3,3',5-Tetrachlorobiphenyl (BZ-57)				
		9215	2,3,3',6-Tetrachlorobiphenyl (BZ-59)				
		9216	2,3,3'-Trichlorobiphenyl (BZ-20)				
		9227	2,3,4',5,6-Pentachlorobiphenyl (BZ-117)				
		9233	2,3,4',5-Tetrachlorobiphenyl (BZ-63)				
		9236	2,3,4',6-Tetrachlorobiphenyl (BZ-64)				
		9241	2,3,4'-Trichlorobiphenyl (BZ-22)				
		9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9005	2,3,4,4',5-Pentachlorobiphenyl (BZ-114)				
		9219	2,3,4,4',6-Pentachlorobiphenyl (BZ-115)				
		9221	2,3,4,4'-Tetrachlorobiphenyl (BZ-60)				
		9225	2,3,4,5,6-Pentachlorobiphenyl (BZ-116)				
		9228	2,3,4,5-Tetrachlorobiphenyl (BZ-61)				
		9234	2,3,4,6-Tetrachlorobiphenyl (BZ-62)				
		9238	2,3,4-Trichlorobiphenyl (BZ-21)				
		9243	2,3,5,6-Tetrachlorobiphenyl (BZ-65)				
		9245	2,3,5-Trichlorobiphenyl (BZ-23)				
		9247	2,3,6-Trichlorobiphenyl (BZ-24)				
		8920	2,3-Dichlorobiphenyl (BZ-5)				
		8940	2,4',5-Trichlorobiphenyl (BZ-31)				
		9255	2,4',6-Trichlorobiphenyl (BZ-32)				
		9256	2,4'-Dichlorobiphenyl (BZ-8)				
		9250	2,4,4',5-Tetrachlorobiphenyl (BZ-74)				
		9251	2,4,4',6-Tetrachlorobiphenyl (BZ-75)				
		9252	2,4,4'-Trichlorobiphenyl (BZ-28)				
		9253	2,4,5-Trichlorobiphenyl (BZ-29)				
		9254	2,4,6-Trichlorobiphenyl (BZ-30)				
		9257	2,4-Dichlorobiphenyl (BZ-7)				
		9258	2,5-Dichlorobiphenyl (BZ-9)				
		9259	2,6-Dichlorobiphenyl (BZ-10)				
		8915	2-Chlorobiphenyl (BZ-1)				
		9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)				
		9015	3,3',4,4',5-Pentachlorobiphenyl (BZ-126)				
		8965	3,3',4,4'-Tetrachlorobiphenyl (BZ-77)				
		9261	3,3',4,5'-Tetrachlorobiphenyl (BZ-79)				
		9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		9262	3,3',4,5-Tetrachlorobiphenyl (BZ-78)				
		9263	3,3',4-Trichlorobiphenyl (BZ-35)				
		9264	3,3',5,5'-Tetrachlorobiphenyl (BZ-80)				
		9265	3,3',5-Trichlorobiphenyl (BZ-36)				
		8925	3,3'-Dichlorobiphenyl (BZ-11)				
		9268	3,4',5-Trichlorobiphenyl (BZ-39)				
		9269	3,4'-Dichlorobiphenyl (BZ-13)				
		8970	3,4,4',5-Tetrachlorobiphenyl (BZ-81)				
		9266	3,4,4'-Trichlorobiphenyl (BZ-37)				
		9267	3,4,5-Trichlorobiphenyl (BZ-38)				
		9270	3,4-Dichlorobiphenyl (BZ-12)				
		9271	3,5-Dichlorobiphenyl (BZ-14)				
		9272	3-Chlorobiphenyl (BZ-2)				
		9273	4,4'-Dichlorobiphenyl (BZ-15)				
		9274	4-Chlorobiphenyl (BZ-3)				
		9105	Decachlorobiphenyl (BZ-209)				
		8914	Sum - Dichlorobiphenyls (BZ-12- + BZ-13)				
		8916	Sum - Heptachlorobiphenyls (BZ-171 + BZ-173)				
		8917	Sum - Heptachlorobiphenyls (BZ-180 + BZ-193)				
		8919	Sum - Hexachlorobiphenyls (BZ-128 + BZ-166)				
		8922	Sum - Hexachlorobiphenyls (BZ-129 + BZ-138 + BZ-163)				
		8927	Sum - Hexachlorobiphenyls (BZ-135 + BZ-151)				
		8928	Sum - Hexachlorobiphenyls (BZ-139 + BZ-140)				
		8929	Sum - Hexachlorobiphenyls (BZ-147 + BZ-149)				
		8931	Sum - Hexachlorobiphenyls (BZ-153 + BZ-168)				
		8932	Sum - Hexachlorobiphenyls (BZ-156 + BZ-157)				
		8934	Sum - Octachlorobiphenyls (BZ-198 + BZ-199)				

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Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8936	Sum - Pentachlorobiphenyls (BZ-107 + BZ-124)				
		8938	Sum - Pentachlorobiphenyls (BZ-110 + BZ-115)				
		8941	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)				
		8943	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-90 + BZ-109 + BZ-119 + BZ-125)				
		8947	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)				
		8948	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)				
		8949	Sum - Pentachlorobiphenyls (BZ-93 + BZ-100)				
		8951	Sum - Pentachlorobiphenyls (BZ-98 + BZ-102)				
		8954	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-71)				
		8957	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)				
		8959	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)				
		8961	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)				
		8962	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)				
		8963	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)				
		8966	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)				
		8967	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)				
		8968	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)				
		8969	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)				
		8876	Total Dichlorobiphenyls				
		8877	Total Heptachlorobiphenyls				
		8888	Total Hexachlorobiphenyls				
		8889	Total Monochlorobiphenyls				
		8891	Total Nonachlorobiphenyls				
		8892	Total Octachlorobiphenyls				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Solids	EPA 1668C					10262109	Chlorinated Biphenyl Cogeners in Water, Soil, Sediment, and Tissue by GC-HRMS
		8896	Total Pentachlorobiphenyls				
		8893	Total Tetrachlorobiphenyls				
		8894	Total Trichlorobiphenyls				
	EPA 3535				1996	10139205	Solid-Phase Extraction (SPE)
		1448	Solid-Phase Extraction				
	EPA 3540C				1996	10140202	Soxhlet Extraction
		1452	Soxhlet Extraction				
	EPA 3546				2000	10141205	Microwave Extraction
		1428	Microwave Extraction				
	EPA 3550B				1996	10141807	Ultrasonic Extraction
		1468	Ultrasonic Extraction				
	EPA 3580A				1992	10143007	Waste Dilution
		1470	Waste Dilution				
	EPA 6850				2007	10304606	Perchlorate in Water, Soils and Solid Wastes Using High Performance Liquid Chromatography/Electrospray Ionization/Mass Spectrometry
		1895	Perchlorate				
	EPA 8290				1994	10187209	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Solids	EPA 8290				1994	10187209	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				
		9438	Hpcdd, total				
		9444	Hpcdf, total				
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				
		9615	TCDF, total				
	EPA 8290A				1998	10187403	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				
		9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				

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MATRIX	Reference	Analyte Code	Analyte	Revision	Rev. Date	Method Code	Description
Solids	EPA 8290A				1998	10187403	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)				
		9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)				
		9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)				
		9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-Hxcdd)				
		9471	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-Hxcdf)				
		9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-Hxcdd)				
		9474	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-Hxcdf)				
		9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-Hxcdd)				
		9477	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-Hxcdf)				
		9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-Pecdd)				
		9543	1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-Pecdf)				
		9480	2,3,4,6,7,8-Hexachlorodibenzofuran				
		9549	2,3,4,7,8-Pentachlorodibenzofuran				
		9618	2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD)				
		9612	2,3,7,8-Tetrachlorodibenzofuran				
		9438	Hpcdd, total				
		9444	Hpcdf, total				
		9468	Hxcdd, total				
		9483	Hxcdf, total				
		9555	Pecdd, total				
		9552	Pecdf, total				
		9609	TCDD, total				

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Solids	EPA 8290A				1998	10187403	Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS
		9615	TCDF, total				
	EPA 9045C				1995	10198400	Soil and Waste pH
		1900	pH				
	EPA 9045D				2002	10244607	Soil and Waste pH
		1900	pH				
	EPA 9056				1994	10199209	Determination of Inorganic Anions by Ion Chromatography
		1730	Fluoride				
	EPA 9056A				2000	10199607	Determination of Inorganic Anions by Ion Chromatography
		1730	Fluoride				
	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9281	1,1,2,2-Tetrafluoro-2-(1,2,2,2-tetrafluoroethoxy)ethane-1-sulfonic acid (NVHOS)				
		9282	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy] ethanesulfonic acid (R-PSDCA)				
		9490	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)				
		6948	1H, 1H, 2H, 2H-Perfluorodecanesulfonic acid (8:2 FTS)				
		9616	1H, 1H, 2H, 2H-perfluorododecane sulfonic acid (10:2 FTS)				
		6946	1H, 1H, 2H, 2H-Perfluorohexanesulfonic acid (4:2 FTS)				
		6947	1H, 1H, 2H, 2H-Perfluorooctanesulfonic acid (6:2 FTS)				
		9283	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)				

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Solids	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9284	2,2-Difluoro-2-(trifluoromethoxy) Acetic acid (PFMOAA)				
		9285	2-Perfluorodecylethanoic acid (10:2 FTCA)				
		9286	2-Perfluorohexylethanoic acid (6:2 FTCA)				
		9316	2-Perfluorooctyl ethanoic acid (FOEA)				
		9340	2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)				
		9338	2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)				
		9353	4,4,5,5,6,6-Heptafluorohexanoic acid (3:3 FTCA)				
		6951	4,8-Dioxa-3H-perfluorononanoic acid (DONA)				
		9287	4-(2-carboxy-1,1,2,2-tetrafluoroethoxy)-2,2,3,3,4,5,5,5-octafluoro-pentanoic acid (R-EVE)				
		6952	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)				
		9460	Hexafluoropropyleneoxide dimer acid (HFPO-DA) (GenX)				
		9395	N-Ethylperfluorooctane sulfonamide (EtFOSAm)				
		9431	N-Ethylperfluorooctane sulfonamido ethanol (EtFOSE)				
		4846	N-Ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)				
		4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)				
		6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)				
		9433	N-Methylperfluorooctanesulfonamide (MeFOSA)				
		6956	Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)				
		6957	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)				

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Solids	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		9288	Perfluoro-2-{[perfluoro-3-(perfluoroethoxy)-2-propanyl]oxy}ethanesulfonic acid (Hydro-PS Acid)				
		9289	Perfluoro-2-ethoxypropanoic acid (PEPA)				
		9290	Perfluoro-2-methoxypropanoic acid (PMPA)				
		9291	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DoA)				
		9293	Perfluoro-3,5,7,9-butaoxadecanoic acid (PFO4DA)				
		9294	Perfluoro-3,5,7-trioxaoctanoic acid (PFO3OA)				
		9295	Perfluoro-3,5-dioxahexanoic acid (PFO2HxA)				
		6965	Perfluoro-3-methoxypropanoic acid (PFMPA)				
		9296	Perfluoro-4-ethylcyclohexanesulfonic acid (PFecHS)				
		9298	Perfluoro-4-isopropoxybutanoic acid (PFPE-1)				
		6966	Perfluoro-4-methoxybutanoic acid (PFMBA)				
		6918	Perfluorobutane sulfonic acid (PFBS)				
		6915	Perfluorobutanoic acid (PFBA)				
		6920	Perfluorodecane sulfonic acid (PFDS)				
		6905	Perfluorodecanoic acid (PFDA)				
		6923	Perfluorododecane sulfonic acid (PFDoS)				
		6903	Perfluorododecanoic acid (PFDoA)				
		9470	Perfluoroheptane sulfonic acid (PFHpS)				
		6908	Perfluoroheptanoic acid (PFHpA)				
		6901	Perfluorohexadecanoic acid (PFHxDA)				
		6927	Perfluorohexane sulfonic acid (PFHxS)				
		6913	Perfluorohexanoic acid (PFHxA)				

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Solids	WS-LC-0025			4.0	2020	60055449	Eurofins Test America Sacramento - Per and Polyfluorinated Alkyl Substances (PFAS) in Water, Soils, Sediments, and Tissues
		6929	Perfluorononane sulfonic acid (PFNS)				
		6906	Perfluorononanoic acid (PFNA)				
		6916	Perfluorooctadecanoic acid (PFODA)				
		6917	Perfluorooctane sulfonamide (PFOSAm)				
		6931	Perfluorooctane sulfonic acid (PFOS)				
		6912	Perfluorooctanoic acid (PFOA)				
		6934	Perfluoropentane sulfonic acid (PFPeS)				
		6914	Perfluoropentanoic acid (PFPeA)				
		9320	Perfluoropropanesulfonic acid (PFPrS)				
		9323	Perfluoropropionic acid (PFPrA)				
		6902	Perfluorotetradecanoic acid (PFTDA)				
		9563	Perfluorotridecanoic acid (PFTrDA)				
		6904	Perfluoroundecanoic acid (PFUnA)				
	WS-MS-0012			2014		60055530	TestAmerica West Sacramento - Nitrosamines by GC/MS/MS with LVI
		6530	n-Nitrosodimethylamine				

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S Webster St
PO Box 7921
Madison, WI 53707-7921

Tony Evers, Governor
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

August 20, 2024

FID: 999615430

Kelly Maddox
Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002

Dear Kelly:

Enclosed is your new laboratory accreditation certificate and scope of accreditation. These documents supersede all previous versions.

Your scope of accreditation is an important document because it identifies the parameters, by technology, for which your laboratory maintains accreditation in the aqueous and non-aqueous matrices. If your laboratory is certified in the drinking water matrix, the scope of accreditation also identifies the parameters and methods for which your laboratory is certified. It is critical that the scope of accreditation be reviewed carefully for errors. **It is your responsibility to make sure that the scope of accreditation agrees with your understanding of the matrices, technologies, parameters, and any drinking water methods for which your laboratory maintains accreditation in Wisconsin.**

If you believe that your Scope of Accreditation contains errors or you would like to discuss how to get reinstatement for any lost parameters, contact the Laboratory Accreditation Program Chemist immediately at 920-412-5970 or by email at Tom.Trainor@wisconsin.gov.

Sincerely,

Zana Sijan

Zana Sijan, Manager
Certification Services

The State of Wisconsin
Department of Natural Resources

has granted

Accreditation under NR 149

to

Eurofins Denver

FID: 999615430

The laboratory is accredited to perform environmental sample analysis in support of covered environmental programs per matrix for the combination of analyte and technology or analyte and method as specified in the attached Scopes of Accreditation.

Printed on: **August 20, 2024**

Expires on: **August 31, 2025**

Zana Sijan

Zana Sijan, Manager
Certification Services

This certificate does not guarantee validity of data generated, but indicates the methodology, equipment, quality control practices, records, and proficiency of the laboratory have been reviewed and found to satisfy the requirements of chapter NR 149, Wisconsin Administrative Code.

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Aqueous (Non-potable Water)

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002

Printed on: **8/16/2024**
Expires on: **8/31/2025**

Colorimetric or Turbidimetric	**Ammonia as N**
	Chemical Oxygen Demand (COD)
	Chromium, Hexavalent
	Cyanide, Available
	Cyanide, Total
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Orthophosphate
	Phenolics, Total
	Phosphorus, Total
	Sulfide
	Turbidity
Nondispersive Infrared (NDIR) or Microcoulometry	**Organic Carbon, Total (TOC)**
	Organic Halides, Total & Adsorbable (TOX & AOX)
Electrometric Assays (ISE)	**pH**
	Specific Conductance
Gravimetric Assays - Residue (solids)	**Residue, Filterable (TDS)**
	Residue, Nonfilterable (TSS)
	Residue, Total (Total Solids)
	Residue, Volatile, Nonfilterable (TVSS)

Extraction/Gravimetric Assays - Oil & Grease as HEM	**Oil & Grease as HEM**
Ion Chromatography (IC)	**Bromide**
	Chloride
	Fluoride
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Sulfate
Titrimetric or Potentiometric Titration Assays	**Alkalinity**
	Hardness, Total as CaCO3
	Sulfide
	Sulfides, Acid-Soluble and Acid-Insoluble
	Sulfite
Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Cadmium
	Calcium
	Chromium, Total

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Aqueous (Non-potable Water)

Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Cobalt**
	Copper
	Hardness, Total as CaCO3
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Strontium
	Thallium
	Tin
	Vanadium
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
	## PESTICIDES, ORGANOCHLORINE (group)
	Atrazine
	Azinphos ethyl

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Aqueous (Non-potable Water)

Gas Chromatography (GC)	**Azinphos methyl (Guthion)**
	Bolstar
	Carbophenothion
	Chlorpyrifos
	Coumaphos
	Demeton-O
	Demeton-S
	Diazinon
	Dichlorvos (DDVP)
	Dimethoate
	Disulfoton
	EPN
	Ethoprop
	Famphur
	Fensulfothion
	Fenthion
	Malathion
	Merphos
	Mevinphos
	Naled
	Parathion (Parathion Ethyl)
	Parathion Methyl

Gas Chromatography (GC)	**Phorate**
	Phosmet (Imidan)
	Ronnel
	Sulfotepp (Tetraethyl dithiopyrophosphate)
	Thionazin (O,O-Diethyl O-2-pyrazinyl phosphorothioate)
	Tokuthion (Prothiofos)
	Trichloronate
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## PAH (group)
	## VOC - VOLATILE ORGANICS (group)
Liquid Chromatography (LC)	**1,3,5-Trinitrobenzene**
	1,3-Dinitrobenzene
	2,4,6-Trinitrotoluene
	2,4-Diamino-6-nitrotoluene
	2,4-Dinitrotoluene
	2,6-Dinitrotoluene
	2-Amino-4,6-dinitrotoluene
	2-Nitrotoluene
	3-Nitrotoluene
	4-Amino-2,6-dinitrotoluene
	4-Nitrotoluene
	HMX

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Aqueous (Non-potable Water)

Liquid Chromatography (LC)	**Nitrobenzene**
	Nitroglycerin
	PETN (Pentaerythritol tetranitrate)
	Picric Acid (Trinitrophenol)
	RDX
	Tetryl
Liquid Chromatography-Mass Spectrometry (LC/MS)	**## PFAS (group)**

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002

Printed on: **8/16/2024**
Expires on: **8/31/2025**

Colorimetric or Turbidimetric	**Cyanide, Total**
	Nitrate
	Nitrate + Nitrite
	Nitrite
Nondispersive Infrared (NDIR) or Microcoulometry	**Organic Carbon, Total (TOC)**
Electrometric Assays (ISE)	**pH**
	Specific Conductance
Gravimetric Assays - Residue (solids)	**Residue, Total**
Ion Chromatography (IC)	**Bromide**
	Chloride
	Fluoride
	Nitrate
	Nitrate + Nitrite
	Nitrite
	Sulfate
Titrimetric or Potentiometric Titration Assays	**Sulfides, Acid-Soluble and Acid-Insoluble**
Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Aluminum**
	Antimony
	Arsenic
	Barium

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)	**Beryllium**
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Potassium
	Selenium
	Sodium
	Strontium
	Thallium
	Vanadium
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
	## PESTICIDES, ORGANOCHLORINE (group)
	Atrazine

Gas Chromatography (GC)	**Azinphos ethyl**
	Azinphos methyl (Guthion)
	Bolstar
	Carbophenothion
	Chlorpyrifos
	Coumaphos
	Demeton-O
	Demeton-S
	Diazinon
	Dichlorvos (DDVP)
	Dimethoate
	Disulfoton
	EPN
	Ethoprop
	Famphur
	Fensulfothion
	Fenthion
	Malathion
	Merphos
	Mevinphos
	Naled
	Parathion (Parathion Ethyl)

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Gas Chromatography (GC)	**Parathion Methyl**
	Phorate
	Phosmet (Imidan)
	Ronnel
	Sulfotepp (Tetraethyl dithiopyrophosphate)
	Thionazin (O,O-Diethyl O-2-pyrazinyl phosphorothioate)
	Tokuthion (Prothiofos)
	Trichloronate
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## PAH (group)
	## VOC - VOLATILE ORGANICS (group)
Liquid Chromatography (LC)	**1,3,5-Trinitrobenzene**
	1,3-Dinitrobenzene
	2,4,6-Trinitrotoluene
	2,4-Diamino-6-nitrotoluene
	2,4-Dinitrotoluene
	2,6-Dinitrotoluene
	2-Amino-4,6-dinitrotoluene
	2-Nitrotoluene
	3-Nitrotoluene
	4-Amino-2,6-dinitrotoluene
	4-Nitrotoluene

Wisconsin Scope of Accreditation

Laboratory FID: 999615430
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Liquid Chromatography (LC)	**HMX**
	Nitrobenzene
	Nitroglycerin
	PETN (Pentaerythritol tetranitrate)
	Picric Acid (Trinitrophenol)
	RDX
	Tetryl
Liquid Chromatography-Mass Spectrometry (LC/MS)	**## PFAS (group)**
Solid Waste Leaching Procedures	**SPLP Extraction**
Hazardous Waste Characteristics	**Corrosivity, Liquids**
	TCLP Extraction

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

State of Florida
Department of Health, Bureau of Public Health Laboratories
This is to certify that

E87689

EUROFINS ST. LOUIS
13715 RIDER TRAIL NORTH
EARTH CITY, MO 63045

has complied with Florida Administrative Code 64E-1,
for the examination of environmental samples in the following categories

DRINKING WATER - RADIOCHEMISTRY, NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - METALS, NON-POTABLE WATER - RADIOCHEMISTRY, SOLID AND CHEMICAL MATERIALS - METALS, SOLID AND CHEMICAL MATERIALS - RADIOCHEMISTRY

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Public Health Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

Date Issued: September 18, 2024 Expiration Date: June 30, 2025

Marie-Claire Rowlinson, PhD, D(ABMM)
Bureau of Public Health Laboratories
DH Form 1697, 7/04
NON-TRANSFERABLE E87689-74-09/18/2024
Supersedes all previously issued certificates

Laboratory Scope of Accreditation

Attachment to Certificate #: E87689-74, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87689** **EPA Lab Code:** **MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
2830	Gross Alpha	EPA 900.0 (GPC)	10242634	Radiochemistry	12/6/2023
2830	Gross Alpha	SM 7110 C	20159028	Radiochemistry	12/8/2022
2840	Gross Beta	EPA 900.0 (GPC)	10242634	Radiochemistry	12/6/2023
3045	Isotopic uranium	DOE U-02-RC	90011408	Radiochemistry	8/15/2018
2965	Radium-226	EPA 903.0	10309407	Radiochemistry	3/31/2015
2970	Radium-228	EPA 904.0	10309805	Radiochemistry	12/10/2008
2985	Radon	SM 7500-Rn B	20173733	Radiochemistry	8/15/2018
2980	Radon-222	ST-RC-0222 / LSC	60051878	Radiochemistry	7/1/2020
1143	Selenium-79	ST-RC-0079 / LSC	60051845	Radiochemistry	7/1/2020
3005	Strontium-90	EPA 905.0	10310006	Radiochemistry	12/10/2008
3030	Tritium	EPA 906.0	10310200	Radiochemistry	12/10/2008
1184	Uranium (mass)	EPA 200.8	10014605	Radiochemistry	8/15/2018

Laboratory Scope of Accreditation

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State Laboratory ID: **E87689** **EPA Lab Code:** **MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1000	Aluminum	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1000	Aluminum	EPA 200.8	10014605	Metals	7/1/2013
1000	Aluminum	EPA 6010D	10155950	Metals	12/12/2022
1000	Aluminum	EPA 6020B	10156420	Metals	12/12/2022
1005	Antimony	EPA 200.7	10013806	Metals	7/1/2013
1005	Antimony	EPA 200.8	10014605	Metals	7/1/2013
1005	Antimony	EPA 6010D	10155950	Metals	12/12/2022
1005	Antimony	EPA 6020B	10156420	Metals	12/12/2022
1010	Arsenic	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1010	Arsenic	EPA 200.8	10014605	Metals	7/1/2013
1010	Arsenic	EPA 6010D	10155950	Metals	12/12/2022
1010	Arsenic	EPA 6020B	10156420	Metals	12/12/2022
1015	Barium	EPA 200.7	10013806	Metals	7/1/2013
1015	Barium	EPA 200.8	10014605	Metals	7/1/2013
1015	Barium	EPA 6010D	10155950	Metals	12/12/2022
1015	Barium	EPA 6020B	10156420	Metals	12/12/2022
1020	Beryllium	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1020	Beryllium	EPA 200.8	10014605	Metals	7/1/2013
1020	Beryllium	EPA 6010D	10155950	Metals	12/12/2022
1020	Beryllium	EPA 6020B	10156420	Metals	12/12/2022
1025	Boron	EPA 200.7	10013806	Metals	7/1/2013
1025	Boron	EPA 6010D	10155950	Metals	12/12/2022
1025	Boron	EPA 6020B	10156420	Metals	12/12/2022
1030	Cadmium	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1030	Cadmium	EPA 200.8	10014605	Metals	7/1/2013
1030	Cadmium	EPA 6010D	10155950	Metals	12/12/2022
1030	Cadmium	EPA 6020B	10156420	Metals	12/12/2022
1035	Calcium	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1035	Calcium	EPA 6010D	10155950	Metals	12/12/2022
1035	Calcium	EPA 6020B	10156420	Metals	12/12/2022
1040	Chromium	EPA 200.7	10013806	Metals	7/1/2013
1040	Chromium	EPA 200.8	10014605	Metals	7/1/2013
1040	Chromium	EPA 6010D	10155950	Metals	12/12/2022
1040	Chromium	EPA 6020B	10156420	Metals	12/12/2022
1050	Cobalt	EPA 200.7	10013806	Metals	7/1/2013
1050	Cobalt	EPA 200.8	10014605	Metals	7/1/2013

Attachment to Certificate #: E87689-74, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87689** **EPA Lab Code:** **MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1050	Cobalt	EPA 6010D	10155950	Metals	12/12/2022
1050	Cobalt	EPA 6020B	10156420	Metals	12/12/2022
1055	Copper	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1055	Copper	EPA 200.8	10014605	Metals	7/1/2013
1055	Copper	EPA 6010D	10155950	Metals	12/12/2022
1055	Copper	EPA 6020B	10156420	Metals	12/12/2022
2826	Gamma Emitters	EPA 901.1	10308608	Radiochemistry	7/1/2013
2830	Gross Alpha	EPA 900.0	10308200	Radiochemistry	7/1/2013
2830	Gross Alpha	EPA 900.0 (GPC)	10242634	Radiochemistry	10/20/2023
2830	Gross Alpha	EPA 9310	10310802	Radiochemistry	7/1/2013
2840	Gross Beta	EPA 900.0	10308200	Radiochemistry	7/1/2013
2840	Gross Beta	EPA 900.0 (GPC)	10242634	Radiochemistry	10/20/2023
2840	Gross Beta	EPA 9310	10310802	Radiochemistry	7/1/2013
1070	Iron	EPA 200.7	10013806	Metals	7/1/2013
1070	Iron	EPA 6010D	10155950	Metals	12/12/2022
1070	Iron	EPA 6020B	10156420	Metals	12/12/2022
1075	Lead	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1075	Lead	EPA 200.8	10014605	Metals	7/1/2013
1075	Lead	EPA 6010D	10155950	Metals	12/12/2022
1075	Lead	EPA 6020B	10156420	Metals	12/12/2022
1080	Lithium	EPA 6010D	10155950	Metals	12/12/2022
1085	Magnesium	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1085	Magnesium	EPA 200.8	10014605	Metals	7/1/2013
1085	Magnesium	EPA 6010D	10155950	Metals	12/12/2022
1085	Magnesium	EPA 6020B	10156420	Metals	12/12/2022
1090	Manganese	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1090	Manganese	EPA 200.8	10014605	Metals	7/1/2013
1090	Manganese	EPA 6010D	10155950	Metals	12/12/2022
1090	Manganese	EPA 6020B	10156420	Metals	12/12/2022
1095	Mercury	EPA 245.1	10036609	Metals	7/1/2013
1095	Mercury	EPA 7470A	10165807	Metals	12/12/2022
1100	Molybdenum	EPA 200.7	10013806	Metals	7/1/2013
1100	Molybdenum	EPA 200.8	10014605	Metals	7/1/2013
1100	Molybdenum	EPA 6010D	10155950	Metals	12/12/2022
1100	Molybdenum	EPA 6020B	10156420	Metals	12/12/2022
1105	Nickel	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013

Attachment to Certificate #: E87689-74, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87689** **EPA Lab Code:** **MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1105	Nickel	EPA 200.8	10014605	Metals	7/1/2013
1105	Nickel	EPA 6010D	10155950	Metals	12/12/2022
1105	Nickel	EPA 6020B	10156420	Metals	12/12/2022
1125	Potassium	EPA 200.7	10013806	Metals	7/1/2013
1125	Potassium	EPA 6010D	10155950	Metals	12/12/2022
1125	Potassium	EPA 6020B	10156420	Metals	12/12/2022
2965	Radium-226	EPA 903.0	10309407	Radiochemistry	7/1/2013
2970	Radium-228	EPA 904.0	10309805	Radiochemistry	7/1/2013
2970	Radium-228	EPA 9320	10208603	Radiochemistry	7/1/2013
1140	Selenium	EPA 200.7	10013806	Metals	7/1/2013
1140	Selenium	EPA 200.8	10014605	Metals	7/1/2013
1140	Selenium	EPA 6010D	10155950	Metals	12/12/2022
1140	Selenium	EPA 6020B	10156420	Metals	12/12/2022
1990	Silica as SiO2	EPA 200.7	10013806	Metals	6/12/2023
1145	Silicon	EPA 6010D	10155950	Metals	6/12/2023
1150	Silver	EPA 200.7	10013806	Metals	7/1/2013
1150	Silver	EPA 200.8	10014605	Metals	7/1/2013
1150	Silver	EPA 6010D	10155950	Metals	12/12/2022
1150	Silver	EPA 6020B	10156420	Metals	12/12/2022
1155	Sodium	EPA 200.7	10013806	Metals	7/1/2013
1155	Sodium	EPA 6010D	10155950	Metals	12/12/2022
1155	Sodium	EPA 6020B	10156420	Metals	12/12/2022
1160	Strontium	EPA 200.7	10013806	Metals	7/1/2013
1160	Strontium	EPA 6010D	10155950	Metals	12/12/2022
1160	Strontium	EPA 6020B	10156420	Metals	12/12/2022
3005	Strontium-90	DOE Sr-03-RC	90009806	Radiochemistry	7/1/2013
3005	Strontium-90	EPA 905.0	10310006	Radiochemistry	7/1/2013
1165	Thallium	EPA 200.7	10013806	Metals	7/1/2013
1165	Thallium	EPA 200.8	10014605	Metals	7/1/2013
1165	Thallium	EPA 6010D	10155950	Metals	12/12/2022
1165	Thallium	EPA 6020B	10156420	Metals	12/12/2022
1170	Thorium	EPA 200.8	10014605	Metals	7/1/2013
1170	Thorium	EPA 6020B	10156420	Metals	12/12/2022
1175	Tin	EPA 200.7	10013806	Metals	7/1/2013
1175	Tin	EPA 6010D	10155950	Metals	12/12/2022
1175	Tin	EPA 6020B	10156420	Metals	12/12/2022

Attachment to Certificate #: E87689-74, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87689 **EPA Lab Code: MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1180	Titanium	EPA 200.7	10013806	Metals	7/1/2013
1180	Titanium	EPA 6010D	10155950	Metals	12/12/2022
1180	Titanium	EPA 6020B	10156420	Metals	12/12/2022
2975	Total radium	EPA 903.0	10309407	Radiochemistry	4/21/2020
2975	Total radium	EPA 9315	10311009	Radiochemistry	7/1/2013
3030	Tritium	EPA 906.0	10310200	Radiochemistry	7/1/2013
1184	Uranium (mass)	EPA 200.8	10014605	Metals	7/1/2013
1184	Uranium (mass)	EPA 6020B	10156420	Metals	12/12/2022
1185	Vanadium	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1185	Vanadium	EPA 200.8	10014605	Metals	7/1/2013
1185	Vanadium	EPA 6010D	10155950	Metals	12/12/2022
1185	Vanadium	EPA 6020B	10156420	Metals	12/12/2022
1190	Zinc	EPA 200.7	10013806	General Chemistry,Metals	7/1/2013
1190	Zinc	EPA 200.8	10014605	Metals	7/1/2013
1190	Zinc	EPA 6010D	10155950	Metals	12/12/2022
1190	Zinc	EPA 6020B	10156420	Metals	12/12/2022

Laboratory Scope of Accreditation

Attachment to Certificate #: E87689-74, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87689** **EPA Lab Code:** **MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1000	Aluminum	EPA 6010D	10155950	Metals	12/12/2022
1000	Aluminum	EPA 6020B	10156420	Metals	12/12/2022
1005	Antimony	EPA 6010D	10155950	Metals	12/12/2022
1005	Antimony	EPA 6020B	10156420	Metals	12/12/2022
1010	Arsenic	EPA 6010D	10155950	Metals	12/12/2022
1010	Arsenic	EPA 6020B	10156420	Metals	12/12/2022
1015	Barium	EPA 6010D	10155950	Metals	12/12/2022
1015	Barium	EPA 6020B	10156420	Metals	12/12/2022
1020	Beryllium	EPA 6010D	10155950	Metals	12/12/2022
1020	Beryllium	EPA 6020B	10156420	Metals	12/12/2022
1025	Boron	EPA 6010D	10155950	Metals	12/12/2022
1025	Boron	EPA 6020B	10156420	Metals	12/12/2022
1030	Cadmium	EPA 6010D	10155950	Metals	12/12/2022
1030	Cadmium	EPA 6020B	10156420	Metals	12/12/2022
1035	Calcium	EPA 6010D	10155950	Metals	12/12/2022
1035	Calcium	EPA 6020B	10156420	Metals	12/12/2022
1040	Chromium	EPA 6010D	10155950	Metals	12/12/2022
1040	Chromium	EPA 6020B	10156420	Metals	12/12/2022
1050	Cobalt	EPA 6010D	10155950	Metals	12/12/2022
1050	Cobalt	EPA 6020B	10156420	Metals	12/12/2022
1055	Copper	EPA 6010D	10155950	Metals	12/12/2022
1055	Copper	EPA 6020B	10156420	Metals	12/12/2022
2830	Gross Alpha	EPA 9310	10310802	Radiochemistry	7/1/2013
2840	Gross Beta	EPA 9310	10310802	Radiochemistry	7/1/2013
1070	Iron	EPA 6010D	10155950	Metals	12/12/2022
1070	Iron	EPA 6020B	10156420	Metals	12/12/2022
1075	Lead	EPA 6010D	10155950	Metals	12/12/2022
1075	Lead	EPA 6020B	10156420	Metals	12/12/2022
1080	Lithium	EPA 6010D	10155950	Metals	12/12/2022
1085	Magnesium	EPA 6010D	10155950	Metals	12/12/2022
1085	Magnesium	EPA 6020B	10156420	Metals	12/12/2022
1090	Manganese	EPA 6010D	10155950	Metals	12/12/2022
1090	Manganese	EPA 6020B	10156420	Metals	12/12/2022
1095	Mercury	EPA 7471B	10166457	Metals	12/12/2022
1100	Molybdenum	EPA 6010D	10155950	Metals	12/12/2022
1100	Molybdenum	EPA 6020B	10156420	Metals	12/12/2022

Ron DeSantis
Governor

Laboratory Scope of Accreditation

Attachment to Certificate #: E87689-74, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87689 **EPA Lab Code: MO00054** **(314) 298-8566**

E87689
Eurofins St. Louis
13715 Rider Trail North
Earth City, MO 63045

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1105	Nickel	EPA 6010D	10155950	Metals	12/12/2022
1105	Nickel	EPA 6020B	10156420	Metals	12/12/2022
1125	Potassium	EPA 6010D	10155950	Metals	12/12/2022
1125	Potassium	EPA 6020B	10156420	Metals	12/12/2022
2970	Radium-228	EPA 9320	10208603	Radiochemistry	7/1/2013
1140	Selenium	EPA 6010D	10155950	Metals	12/12/2022
1140	Selenium	EPA 6020B	10156420	Metals	12/12/2022
1145	Silicon	EPA 6010D	10155950	Metals	12/12/2022
1150	Silver	EPA 6010D	10155950	Metals	12/12/2022
1150	Silver	EPA 6020B	10156420	Metals	12/12/2022
1155	Sodium	EPA 6010D	10155950	Metals	12/12/2022
1155	Sodium	EPA 6020B	10156420	Metals	12/12/2022
1160	Strontium	EPA 6010D	10155950	Metals	12/12/2022
1160	Strontium	EPA 6020B	10156420	Metals	12/12/2022
1165	Thallium	EPA 6010D	10155950	Metals	12/12/2022
1165	Thallium	EPA 6020B	10156420	Metals	12/12/2022
1175	Tin	EPA 6010D	10155950	Metals	12/12/2022
1175	Tin	EPA 6020B	10156420	Metals	12/12/2022
1180	Titanium	EPA 6010D	10155950	Metals	12/12/2022
1180	Titanium	EPA 6020B	10156420	Metals	12/12/2022
2975	Total radium	EPA 9315	10311009	Radiochemistry	7/1/2013
1184	Uranium (mass)	EPA 6020B	10156420	Metals	12/12/2022
1185	Vanadium	EPA 6010D	10155950	Metals	12/12/2022
1185	Vanadium	EPA 6020B	10156420	Metals	12/12/2022
1190	Zinc	EPA 6010D	10155950	Metals	12/12/2022
1190	Zinc	EPA 6020B	10156420	Metals	12/12/2022

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S Webster St
PO Box 7921
Madison, WI 53707-7921

Tony Evers, Governor
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

August 30, 2024

FID: 399140830

Joseph (Joe) Ruby III
Eurofins Burlington
530 Community Drive, Suite 11
South Burlington, VT 05430

Dear Joseph (Joe):

Enclosed is your new laboratory accreditation certificate and scope of accreditation. These documents supersede all previous versions.

Your scope of accreditation is an important document because it identifies the parameters, by technology, for which your laboratory maintains accreditation in the aqueous and non-aqueous matrices. If your laboratory is certified in the drinking water matrix, the scope of accreditation also identifies the parameters and methods for which your laboratory is certified. It is critical that the scope of accreditation be reviewed carefully for errors. **It is your responsibility to make sure that the scope of accreditation agrees with your understanding of the matrices, technologies, parameters, and any drinking water methods for which your laboratory maintains accreditation in Wisconsin.**

If you believe that your Scope of Accreditation contains errors or you would like to discuss how to get reinstatement for any lost parameters, contact the Laboratory Accreditation Program Chemist immediately at 920-412-5970 or by email at Tom.Trainor@wisconsin.gov.

Sincerely,

Zana Sijan

Zana Sijan, Manager
Certification Services

Wisconsin Scope of Accreditation

Laboratory FID: 399140830
CERTIFICATION
Aqueous (Non-potable Water)

Eurofins Burlington
530 Community Drive, Suite 11
South Burlington, VT 05403

Printed on: 8/30/2024
Expires on: 8/31/2025

Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Thallium

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

Wisconsin Scope of Accreditation

Laboratory FID: 399140830
CERTIFICATION
Aqueous (Non-potable Water)

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Vanadium**
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## VOC - VOLATILE ORGANICS (group)

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

Wisconsin Scope of Accreditation

Laboratory FID: 399140830
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Eurofins Burlington
530 Community Drive, Suite 11
South Burlington, VT 05403

Printed on: **8/30/2024**
Expires on: **8/31/2025**

Cold Vapor Atomic Absorption Spectrophotometry (CVAA)	**Mercury**
Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Aluminum**
	Antimony
	Arsenic
	Barium
	Beryllium
	Cadmium
	Calcium
	Chromium, Total
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Nickel
	Potassium
	Selenium
	Silver
	Sodium
	Thallium

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

Wisconsin Scope of Accreditation

Laboratory FID: 399140830
CERTIFICATION
Non-Aqueous (Biosolids, Leachates, Soils, Tissues, & Wastes)

Inductively Coupled Plasma Emission Spectrophotometry (ICP)	**Vanadium**
	Zinc
Gas Chromatography (GC)	**## PCB as AROCLORS (group)**
Gas Chromatography-Mass Spectrometry (GC/MS)	**## BNA - SEMIVOLATILE ORGANICS (group)**
	## VOC - VOLATILE ORGANICS (group)

This laboratory is accredited under NR 149 to perform environmental sample analysis in support of covered environmental programs for the combination of analyte or analyte group and technology in the aqueous and non-aqueous matrices and analyte or analyte group and method in the drinking water matrix as specified in this Scope of Accreditation.

The State of Wisconsin
Department of Natural Resources

has granted

Accreditation under NR 149

to

Eurofins Burlington

FID: 399140830

The laboratory is accredited to perform environmental sample analysis in support of covered environmental programs per matrix for the combination of analyte and technology or analyte and method as specified in the attached Scopes of Accreditation.

Printed on: **August 30, 2024**

Expires on: **August 31, 2025**

Zana Sijan

Zana Sijan, Manager
Certification Services

WISCONSIN
DEPT. OF NATURAL RESOURCES

This certificate does not guarantee validity of data generated, but indicates the methodology, equipment, quality control practices, records, and proficiency of the laboratory have been reviewed and found to satisfy the requirements of chapter NR 149, Wisconsin Administrative Code.

State of New Jersey

Department of Environmental Protection

Certifies That

EUROFINS BURLINGTON

Laboratory Certification ID # VT972

is hereby approved as a

Nationally Accredited Environmental Laboratory

to perform the analyses as indicated on the Annual Certified Parameter List which must accompany this certificate to be valid

having duly met the requirements of the

Regulations Governing the Certification of Laboratories and Environmental Measurements N.J.A.C. 7:18 et. seq.

and

having been found compliant with the 2016 TNI Standard approved by the

The NELAC Institute

Expires June 30, 2025

NELAP RECOGNIZED TNI ACCREDITATION BODY

Michele M. Potter
Manager

THE GREAT SEAL OF THE STATE OF NEW JERSEY

NJDEP is a NELAP Recognized Accreditation Body

This certificate is to be conspicuously displayed at the laboratory with the annual certified parameter list in a location on the premises visible to the public. Consumers are urged to verify the laboratory's current accreditation status with the State of NJ, NELAP.

The State of Wisconsin
Department of Natural Resources

has granted

Accreditation under NR 149

to

Eurofins Eaton Analytical, LLC - Indiana

FID: 999766900

The laboratory is accredited to perform environmental sample analysis in support of covered environmental programs per matrix for the combination of analyte and technology or analyte and method as specified in the attached Scopes of Accreditation.

Printed on: **August 08, 2024**

Expires on: **August 31, 2025**

Zana Sijan

Zana Sijan, Manager
Certification Services

WISCONSIN
DEPT. OF NATURAL RESOURCES

This certificate does not guarantee validity of data generated, but indicates the methodology, equipment, quality control practices, records, and proficiency of the laboratory have been reviewed and found to satisfy the requirements of chapter NR 149, Wisconsin Administrative Code.

Wisconsin Scope of Accreditation

Laboratory FID: 999766900
CERTIFICATION
Drinking Water (Potable Water)

Eurofins Eaton Analytical, LLC - Indiana
110 South Hill Street
South Bend, IN 46617

Printed on: 12/20/2024
Expires on: 8/31/2025

Disinfection By-products	**## HALOACETIC ACIDS (5) - EPA 552.2**
	## THM (group) - EPA 524.2
	## THM (group) - EPA 524.3
	## THM (group) - EPA 551.1
	Bromate - EPA 300.1
	Bromate - EPA 317.0 Rev. 2.0
	Bromide - EPA 300.0
	Chlorite - EPA 300.0
Primary Inorganics Contaminants (Non-Metals)	**Cyanide - EPA 335.4**
	Fluoride - EPA 300.0
	Fluoride - SM 4500-F C
	Nitrate - EPA 300.0
	Nitrate - EPA 353.2
	Nitrate + Nitrite - EPA 353.2
	Nitrite - EPA 353.2
Primary Inorganics Contaminants (Metals)	**Antimony - EPA 200.8**
	Arsenic - EPA 200.8
	Barium - EPA 200.8
	Beryllium - EPA 200.8
	Cadmium - EPA 200.8
	Chromium - EPA 200.8

Wisconsin Scope of Accreditation

Laboratory FID: 999766900
CERTIFICATION
Drinking Water (Potable Water)

Primary Inorganics Contaminants (Metals)	**Copper - EPA 200.8**
	Lead - EPA 200.8
	Mercury - EPA 200.8
	Mercury - EPA 245.1
	Nickel - EPA 200.8
	Selenium - EPA 200.8
	Thallium - EPA 200.8
Secondary Inorganic Contaminants (Non-Metals)	**Alkalinity - SM 2320B**
	Chloride - EPA 300.0
	Chlorine, Free - SM 4500-Cl G
	Chlorine, Total - SM 4500-Cl G
	Conductivity - SM 2510B
	Diss. Org. Carbon (DOC) - SM5310C
	Orthophosphate - SM 4500-P E
	pH - EPA 150.1
	pH - SM 4500-H+ B
	Sulfate - EPA 300.0
	SUVA (calc.) - EPA 415.3
	TDS (Total Dissolved Solids) - SM 2540C
	Total Organic Carbon (TOC) - SM5310C
	Turbidity - EPA 180.1
	UV254 - SM5910B

Wisconsin Scope of Accreditation

Laboratory FID: 999766900
CERTIFICATION
Drinking Water (Potable Water)

Secondary Inorganic Contaminants (Metals)	**Aluminum - EPA 200.8**
	Calcium - EPA 200.7
	Iron - EPA 200.7
	Magnesium - EPA 200.7
	Manganese - EPA 200.8
	Silica - EPA 200.7
	Silver - EPA 200.8
	Sodium - EPA 200.7
	Zinc - EPA 200.8
SOC - Organochlorine Pesticides	**Aldrin - EPA 525.2**
	Chlordane - EPA 505
	Dieldrin - EPA 525.2
	Endrin - EPA 525.2
	Heptachlor - EPA 525.2
	Heptachlor epoxide - EPA 525.2
	Lindane (gamma-BHC) - EPA 525.2
	Methoxychlor - EPA 525.2
	Toxaphene - EPA 505
SOC - N/P Pesticides	**Alachlor - EPA 525.2**
	Atrazine - EPA 525.2
	Butachlor - EPA 525.2
	Metolachlor - EPA 525.2

SOC - N/P Pesticides	**Metribuzin - EPA 525.2**
	Propachlor - EPA 525.2
	Simazine - EPA 525.2
SOC - Herbicides	**2,4-D - EPA 515.3**
	Dalapon - EPA 515.3
	Dicamba - EPA 515.3
	Dinoseb - EPA 515.3
	Pentachlorophenol - EPA 515.3
	Picloram - EPA 515.3
	Silvex (2.4.5-TP) - EPA 515.3
SOC - Miscellaneous	**## PFAS (group) - EPA 533 (25)**
	## PFAS (group) – EPA 537.1 (18)
	3-Hydroxycarbofuran - EPA 531.2
	Aldicarb - EPA 531.2
	Aldicarb Sulfone - EPA 531.2
	Aldicarb Sulfoxide - EPA 531.2
	Benzo[a]pyrene - EPA 525.2
	Carbaryl - EPA 531.2
	Carbofuran - EPA 531.2
	Di(2-ethylhexyl)adipate - EPA 525.2
	Di(2-ethylhexyl)phthalate - EPA 525.2
	Dibromochloropropane (DBCP) - EPA 504.1

SOC - Miscellaneous	**Dibromochloropropane (DBCP) - EPA 524.3**
	Diquat - EPA 549.2
	Endothall - EPA 548.1
	Ethylene Dibromide (EDB) - EPA 504.1
	Ethylene Dibromide (EDB) - EPA 524.3
	Glyphosate - EPA 547
	Hexachlorobenzene - EPA 525.2
	Hexachlorocyclopentadiene - EPA 525.2
	Methomyl - EPA 531.2
	Oxamyl (Vydate) - EPA 531.2
	PCBs (as Aroclors) Screening - EPA 505
Volatile Organic Compounds (VOC)	**## VOCS, REGULATED (group) - EPA 524.2**
	## VOCS, UNREGULATED (group) - EPA 524.2
	1,2,3-Trichloropropane - EPA 524.3

Laboratory Scope of Accreditation

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
5105	1,1,1,2-Tetrachloroethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5190	1,1,1-Trichloro-2-propanone	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
5160	1,1,1-Trichloroethane	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5110	1,1,2,2-Tetrachloroethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5165	1,1,2-Trichloroethane	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
7450	1,1-Dichloro-2-propanone	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
7450	1,1-Dichloro-2-propanone	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
4630	1,1-Dichloroethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4640	1,1-Dichloroethylene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4670	1,1-Dichloropropene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5150	1,2,3-Trichlorobenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5180	1,2,3-Trichloropropane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5180	1,2,3-Trichloropropane	EPA 524.3	10089302	Group II Unregulated Contaminants	7/25/2020
5155	1,2,4-Trichlorobenzene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5210	1,2,4-Trimethylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4570	1,2-Dibromo-3-chloropropane (DBCP)	EPA 504.1	10082801	Synthetic Organic Contaminants	7/25/2020
4570	1,2-Dibromo-3-chloropropane (DBCP)	EPA 524.3	10089302	Synthetic Organic Contaminants	7/25/2020
4585	1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 504.1	10082801	Synthetic Organic Contaminants	7/25/2020
4585	1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 524.3	10089302	Synthetic Organic Contaminants	7/25/2020
4610	1,2-Dichlorobenzene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4635	1,2-Dichloroethane	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4655	1,2-Dichloropropane	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5215	1,3,5-Trimethylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4615	1,3-Dichlorobenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4660	1,3-Dichloropropane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4620	1,4-Dichlorobenzene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4735	1,4-Dioxane (1,4-Diethyleneoxide)	EPA 522	10088570	Group III Unregulated Contaminants	7/25/2020
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
4480	1-Chlorobutane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
4665	2,2-Dichloropropane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8655	2,4,5-T	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
8545	2,4-D	EPA 515.3	10088401	Synthetic Organic Contaminants	7/25/2020
8560	2,4-DB	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
4410	2-Butanone (Methyl ethyl ketone, MEK)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4535	2-Chlorotoluene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4860	2-Hexanone	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5020	2-Nitropropane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8600	3,5-Dichlorobenzoic acid	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
7710	3-Hydroxycarbofuran	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7355	4,4'-DDD	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
7360	4,4'-DDE	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
7365	4,4'-DDT	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
4540	4-Chlorotoluene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4995	4-Methyl-2-pentanone (MIBK)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
5505	Acenaphthylene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
4300	Acetaldehyde	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
4315	Acetone	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8505	Acifluorfen	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
4340	Acrylonitrile	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
7005	Alachlor	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
7010	Aldicarb (Temik)	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7015	Aldicarb sulfone	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7020	Aldicarb sulfoxide	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7025	Aldrin	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
1505	Alkalinity as CaCO3	SM 2320 B	20045607	Primary Inorganic Contaminants	7/25/2020
4355	Allyl chloride (3-Chloropropene)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1000	Aluminum	EPA 200.8	10014605	Secondary Inorganic Contaminants	7/25/2020
5555	Anthracene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
1005	Antimony	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8880	Aroclor-1016 (PCB-1016)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
8885	Aroclor-1221 (PCB-1221)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
8890	Aroclor-1232 (PCB-1232)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
8895	Aroclor-1242 (PCB-1242)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
8900	Aroclor-1248 (PCB-1248)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
8905	Aroclor-1254 (PCB-1254)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
8910	Aroclor-1260 (PCB-1260)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
1010	Arsenic	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
7065	Atrazine	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
1015	Barium	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
8530	Bentazon	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
5570	Benzaldehyde	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
4375	Benzene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5575	Benzo(a)anthracene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
5580	Benzo(a)pyrene	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
5585	Benzo(b)fluoranthene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
5590	Benzo(g,h,i)perylene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
5600	Benzo(k)fluoranthene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
1020	Beryllium	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
7130	Bromacil	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
1535	Bromate	EPA 300.1	10275602	Primary Inorganic Contaminants	7/25/2020
1535	Bromate	EPA 317.0	10237602	Primary Inorganic Contaminants	7/25/2020
1540	Bromide	EPA 300.0	10053200	Primary Inorganic Contaminants	7/25/2020
9312	Bromoacetic acid	EPA 552.2	10095804	Group I Unregulated Contaminants,Synthetic Organic Contaminants	7/25/2020
4385	Bromobenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
9315	Bromochloroacetic acid	EPA 552.2	10095804	Group I Unregulated Contaminants	7/25/2020
7140	Bromochloroacetonitrile	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
4390	Bromochloromethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8535	Bromodichloroacetic acid(BDCAA)	EPA 552.2	10095804	Group I Unregulated Contaminants	7/25/2020
4395	Bromodichloromethane	EPA 524.2	10088809	Other Regulated Contaminants,Group II Unregulated Contaminants	7/25/2020
4395	Bromodichloromethane	EPA 524.3	10089302	Group II Unregulated Contaminants	7/25/2020
4395	Bromodichloromethane	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
4400	Bromoform	EPA 524.2	10088809	Other Regulated Contaminants,Group II Unregulated Contaminants	7/25/2020

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
4400	Bromoform	EPA 524.3	10089302	Group II Unregulated Contaminants	7/25/2020
4400	Bromoform	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
7160	Butachlor	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
5670	Butyl benzyl phthalate	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
4430	Butyraldehyde	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
1030	Cadmium	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
1035	Calcium	EPA 200.7	10013806	Primary Inorganic Contaminants	7/25/2020
7195	Carbaryl (Sevin)	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7205	Carbofuran (Furadan)	EPA 531.2	10091302	Synthetic Organic Contaminants	7/25/2020
4450	Carbon disulfide	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4455	Carbon tetrachloride	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4460	Chloral hydrate	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
8540	Chloramben	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
1570	Chlorate	EPA 300.0	10053200	Secondary Inorganic Contaminants	7/25/2020
7250	Chlordane (tech.)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
1575	Chloride	EPA 300.0	10053200	Secondary Inorganic Contaminants	7/25/2020
1595	Chlorite	EPA 300.0	10053200	Primary Inorganic Contaminants	7/25/2020
9336	Chloroacetic acid	EPA 552.2	10095804	Synthetic Organic Contaminants,Group I Unregulated Contaminants	7/25/2020
4470	Chloroacetonitrile	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4475	Chlorobenzene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
9339	Chlorodibromoacetic acid(CDBAA)	EPA 552.2	10095804	Group I Unregulated Contaminants	7/25/2020
4485	Chloroethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4505	Chloroform	EPA 524.2	10088809	Other Regulated Contaminants,Group II Unregulated Contaminants	7/25/2020
4505	Chloroform	EPA 524.3	10089302	Group II Unregulated Contaminants	7/25/2020
4505	Chloroform	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
7270	Chloropicrin	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
7285	Chlorothalonil	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
1040	Chromium	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
1045	Chromium VI	EPA 218.6	10028009	Secondary Inorganic Contaminants	7/25/2020
1045	Chromium VI	EPA 218.7	10268414	Primary Inorganic Contaminants	7/25/2020
5855	Chrysene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
4645	cis-1,2-Dichloroethylene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4680	cis-1,3-Dichloropropene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1605	Color	SM 2120 B	20039309	Secondary Inorganic Contaminants	7/25/2020

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Eurofins Eaton Analytical, LLC - South Bend
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Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1610	Conductivity	SM 2510 B	20048606	Primary Inorganic Contaminants	7/25/2020
1055	Copper	EPA 200.8	10014605	Secondary Inorganic Contaminants,Primary Inorganic Contaminants	7/25/2020
1620	Corrosivity (langlier index)	SM 2330 B	20003207	Secondary Inorganic Contaminants	7/25/2020
4545	Crotonaldehyde	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
2510	Cryptosporidium	EPA 1623	10236609	Microbiology	7/25/2020
4560	Cyclohexanone	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
8550	Dacthal (DCPA)	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
8555	Dalapon	EPA 515.3	10088401	Synthetic Organic Contaminants	7/25/2020
4565	Decanal	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
6065	Di(2-ethylhexyl) phthalate (DEHP)	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
6062	Di(2-ethylhexyl)adipate	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
5895	Dibenz(a,h)anthracene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
9357	Dibromoacetic acid	EPA 552.2	10095804	Synthetic Organic Contaminants,Group I Unregulated Contaminants	7/25/2020
7420	Dibromoacetonitrile	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
4575	Dibromochloromethane	EPA 524.2	10088809	Other Regulated Contaminants,Group II Unregulated Contaminants	7/25/2020
4575	Dibromochloromethane	EPA 524.3	10089302	Group II Unregulated Contaminants	7/25/2020
4575	Dibromochloromethane	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
4595	Dibromomethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8595	Dicamba	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
9360	Dichloroacetic acid	EPA 552.2	10095804	Group I Unregulated Contaminants,Synthetic Organic Contaminants	7/25/2020
7440	Dichloroacetonitrile	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
4625	Dichlorodifluoromethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8605	Dichloroprop (Dichlorprop)	EPA 515.3	10088401	Group I Unregulated Contaminants	7/25/2020
7470	Dieldrin	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
4725	Diethyl ether	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
6070	Diethyl phthalate	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
6135	Dimethyl phthalate	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
5925	Di-n-butyl phthalate	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
8620	Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 515.3	10088401	Synthetic Organic Contaminants	7/25/2020
9390	Diquat	EPA 549.2	10093400	Synthetic Organic Contaminants	7/25/2020
1710	Dissolved organic carbon (DOC)	SM 5310 C	20138630	Primary Inorganic Contaminants	7/25/2020

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E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7525	Endothall	EPA 548.1	10092805	Synthetic Organic Contaminants	7/25/2020
7540	Endrin	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
7555	EPTC (Eptam, s-ethyl-dipropyl thio carbamate)	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
2525	Escherichia coli	COLISURE	60029609	Microbiology	7/25/2020
2525	Escherichia coli	SM 9223 B (Colilert Quanti-Tray)-2004	20211614	Microbiology	7/25/2020
2525	Escherichia coli	SM 9223 B (Colilert)-2004	20037687	Microbiology	7/25/2020
2525	Escherichia coli	SM 9223 B (Colilert-18) (P/A) 20th ed.	20214602	Microbiology	7/25/2020
4810	Ethyl methacrylate	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4765	Ethylbenzene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4770	Ethyl-t-butylether (ETBE)	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
6270	Fluorene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
1730	Fluoride	EPA 300.0	10053200	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	7/25/2020
1730	Fluoride	SM 4500 F-C	20102403	Primary Inorganic Contaminants	7/25/2020
4815	Formaldehyde	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
2545	Giardia	EPA 1623	10236609	Microbiology	7/25/2020
9413	Glyoxal	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
9411	Glyphosate	EPA 547	10092009	Synthetic Organic Contaminants	7/25/2020
2830	Gross Alpha	NJ ECLS-R-GA Rev.8	90014394	Radiochemistry	7/25/2020
2830	Gross Alpha	SM 7110 B	20157055	Radiochemistry	7/25/2020
2830	Gross Alpha	SM 7110 C	20159028	Radiochemistry	7/25/2020
2840	Gross Beta	SM 7110 B	20157055	Radiochemistry	7/25/2020
1750	Hardness	SM 2340 B	20046600	Secondary Inorganic Contaminants	7/25/2020
7685	Heptachlor	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
7690	Heptachlor epoxide	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
4820	Heptanal	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
2555	Heterotrophic plate count	SIMPLATE	60032602	Microbiology	7/25/2020
6275	Hexachlorobenzene	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
4835	Hexachlorobutadiene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
6285	Hexachlorocyclopentadiene	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
4840	Hexachloroethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020

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State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
3825	Hexanaldehyde	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
6315	Indeno(1,2,3-cd)pyrene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
4870	Iodomethane (Methyl iodide)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1070	Iron	EPA 200.7	10013806	Secondary Inorganic Contaminants	7/25/2020
4900	Isopropylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1075	Lead	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
5240	m+p-Xylenes	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1085	Magnesium	EPA 200.7	10013806	Primary Inorganic Contaminants	7/25/2020
1090	Manganese	EPA 200.8	10014605	Secondary Inorganic Contaminants	7/25/2020
1095	Mercury	EPA 200.8	10014605	Primary Inorganic Contaminants	6/6/2024
1095	Mercury	EPA 245.1	10036609	Primary Inorganic Contaminants	7/25/2020
4925	Methacrylonitrile	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
7800	Methiocarb (Mesurol)	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7805	Methomyl (Lannate)	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
7810	Methoxychlor	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
4945	Methyl acrylate	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4950	Methyl bromide (Bromomethane)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4960	Methyl chloride (Chloromethane)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
7266	Methyl Glyoxal	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
4990	Methyl methacrylate	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5000	Methyl tert-butyl ether (MTBE)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4975	Methylene chloride	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
7835	Metolachlor	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
7845	Metribuzin	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
7875	Molinate	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
1100	Molybdenum	EPA 200.8	10014605	Secondary Inorganic Contaminants	7/25/2020
5005	Naphthalene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4435	n-Butylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
1105	Nickel	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
1805	Nitrate	EPA 300.0	10053200	Primary Inorganic Contaminants	7/25/2020
1805	Nitrate	EPA 353.2	10067604	Primary Inorganic Contaminants	7/25/2020
1835	Nitrite	EPA 353.2	10067604	Primary Inorganic Contaminants	7/25/2020
5015	Nitrobenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020

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State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6575	Nonanal	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
5090	n-Propylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
9525	Octanal	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
1870	Orthophosphate as P	SM 4500-P E	20025803	Primary Inorganic Contaminants	7/25/2020
7940	Oxamyl	EPA 531.2	10091302	Synthetic Organic Contaminants	7/25/2020
5250	o-Xylene	EPA 524.2	10088809	Group I Unregulated Contaminants	7/25/2020
9528	Paraquat	EPA 549.2	10093400	Group I Unregulated Contaminants	7/25/2020
8872	PCB Screen as AROCLORS	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
5035	Pentachloroethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
6605	Pentachlorophenol	EPA 515.3	10088401	Synthetic Organic Contaminants	7/25/2020
1895	Perchlorate	EPA 331.0	10059708	Secondary Inorganic Contaminants	7/25/2020
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6918	Perfluorobutane Sulfonic Acid (PFBS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6918	Perfluorobutane Sulfonic Acid (PFBS)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6915	Perfluorobutanoic Acid (PFBA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6905	Perfluorodecanoic Acid (PFDA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6905	Perfluorodecanoic Acid (PFDA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6903	Perfluorododecanoic Acid (PFDoA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6903	Perfluorododecanoic Acid (PFDoA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
9470	Perfluoroheptane Sulfonic Acid (PFHpS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6908	Perfluoroheptanoic Acid (PFHpA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6908	Perfluoroheptanoic Acid (PFHpA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6927	Perfluorohexane Sulfonic Acid (PFHxS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6927	Perfluorohexane Sulfonic Acid (PFHxS)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6913	Perfluorohexanoic Acid (PFHxA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6913	Perfluorohexanoic Acid (PFHxA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6906	Perfluorononanoic Acid (PFNA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6906	Perfluorononanoic Acid (PFNA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6931	Perfluorooctane sulfonic acid (PFOS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6931	Perfluorooctane sulfonic acid (PFOS)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6912	Perfluorooctanoic Acid (PFOA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020

Laboratory Scope of Accreditation

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87775 **EPA Lab Code: IN00035** **(574) 233-4777**

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Eurofins Eaton Analytical, LLC - South Bend
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Matrix: Drinking Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
6912	Perfluorooctanoic Acid (PFOA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6934	Perfluoropentane Sulfonic Acid (PFPeS)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6914	Perfluoropentanoic Acid (PFPeA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6902	Perfluorotetradecanoic acid (PFTDA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
9563	Perfluorotridecanoic acid (PFTrDA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
6904	Perfluoroundecanoic acid (PFUnDA)	EPA 533	10091619	Group III Unregulated Contaminants	7/25/2020
6904	Perfluoroundecanoic acid (PFUnDA)	EPA 537.1 (Rev. 2)	10091595	Group III Unregulated Contaminants	10/25/2024
1900	pH	EPA 150.1	10008409	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	7/25/2020
1900	pH	SM 4500-H+ B-2011	20105220	Secondary Inorganic Contaminants	6/6/2024
6615	Phenanthrene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
8645	Picloram	EPA 515.3	10088401	Synthetic Organic Contaminants	7/25/2020
4910	p-Isopropyltoluene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1125	Potassium	EPA 200.7	10013806	Secondary Inorganic Contaminants	7/25/2020
8040	Prometryn	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
8045	Propachlor (Ramrod)	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
3965	Propionaldehyde (Propanal)	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020
5080	Propionitrile (Ethyl cyanide)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8080	Propoxur (Baygon)	EPA 531.2	10091302	Group I Unregulated Contaminants	7/25/2020
6665	Pyrene	EPA 525.2	10090003	Group III Unregulated Contaminants	10/25/2024
2965	Radium-226	SM 7500-Ra B	20170610	Radiochemistry	7/25/2020
2970	Radium-228	SM 7500-Ra D	20173619	Radiochemistry	7/25/2020
2985	Radon	SM 7500-Rn B	20173733	Radiochemistry	7/25/2020
1945	Residual free chlorine	SM 4500-Cl G	20081441	Primary Inorganic Contaminants	7/25/2020
1955	Residue-filterable (TDS)	SM 2540 C	20050402	Secondary Inorganic Contaminants	7/25/2020
4440	sec-Butylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1140	Selenium	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
1990	Silica as SiO2	EPA 200.7	10013806	Primary Inorganic Contaminants	7/25/2020
1150	Silver	EPA 200.8	10014605	Secondary Inorganic Contaminants	7/25/2020
8650	Silvex (2,4,5-TP)	EPA 515.3	10088401	Synthetic Organic Contaminants	7/25/2020
8125	Simazine	EPA 525.2	10090003	Synthetic Organic Contaminants	10/25/2024
1155	Sodium	EPA 200.7	10013806	Primary Inorganic Contaminants	7/25/2020
5100	Styrene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
2000	Sulfate	EPA 300.0	10053200	Secondary Inorganic Contaminants,Primary Inorganic Contaminants	7/25/2020
4370	T-amylmethylether (TAME)	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8180	Terbacil	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
4420	tert-Butyl alcohol (2-Methyl-2-propanol)	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4445	tert-Butylbenzene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
5115	Tetrachloroethylene (Perchloroethylene)	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5120	Tetrahydrofuran (THF)	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
1165	Thallium	EPA 200.8	10014605	Primary Inorganic Contaminants	7/25/2020
5140	Toluene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
2500	Total coliforms	COLISURE	60029609	Microbiology	7/25/2020
2500	Total coliforms	SM 9223 B (Colilert Quanti-Tray)-2004	20211614	Microbiology	7/25/2020
2500	Total coliforms	SM 9223 B (Colilert)-2004	20037687	Microbiology	7/25/2020
2500	Total coliforms	SM 9223 B (Colilert-18) (P/A) 20th ed.	20214602	Microbiology	7/25/2020
1645	Total cyanide	EPA 335.4	10061402	Primary Inorganic Contaminants	7/25/2020
9414	Total haloacetic acids (HAA5)	EPA 552.2	10095804	Synthetic Organic Contaminants	7/25/2020
1825	Total nitrate-nitrite	EPA 353.2	10067604	Primary Inorganic Contaminants	7/25/2020
2040	Total organic carbon	SM 5310 C	20138630	Primary Inorganic Contaminants	7/25/2020
1940	Total residual chlorine	SM 4500-Cl G	20081441	Primary Inorganic Contaminants	7/25/2020
5205	Total trihalomethanes	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5205	Total trihalomethanes	EPA 524.3	10089302	Other Regulated Contaminants	7/25/2020
5205	Total trihalomethanes	EPA 551.1	10094801	Other Regulated Contaminants	7/25/2020
8250	Toxaphene (Chlorinated camphene)	EPA 505	10083406	Synthetic Organic Contaminants	7/25/2020
4700	trans-1,2-Dichloroethylene	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
4685	trans-1,3-Dichloropropene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
4605	trans-1,4-Dichloro-2-butene	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
9639	Tribromoacetic acid (TBAA)	EPA 552.2	10095804	Group I Unregulated Contaminants	7/25/2020
9642	Trichloroacetic acid	EPA 552.2	10095804	Group I Unregulated Contaminants,Synthetic Organic Contaminants	7/25/2020
8270	Trichloroacetonitrile	EPA 551.1	10094801	Group II Unregulated Contaminants	7/25/2020
5170	Trichloroethene (Trichloroethylene)	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5175	Trichlorofluoromethane	EPA 524.2	10088809	Group II Unregulated Contaminants	7/25/2020
8295	Trifluralin (Treflan)	EPA 525.2	10090003	Group I Unregulated Contaminants	10/25/2024
3030	Tritium	EPA 906.0	10310200	Radiochemistry	7/25/2020
2055	Turbidity	EPA 180.1	10011800	Secondary Inorganic Contaminants	7/25/2020
1184	Uranium (mass)	EPA 200.8	10014605	Radiochemistry	7/25/2020
2060	UV 254	SM 5910 B	20146401	Primary Inorganic Contaminants	7/25/2020
4040	Valeraldehyde (Pentanal)	EPA 556	10097004	Group III Unregulated Contaminants	7/25/2020

Ron DeSantis
Governor

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Drinking Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
1185	Vanadium	EPA 200.8	10014605	Secondary Inorganic Contaminants	7/25/2020
5235	Vinyl chloride	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
5260	Xylene (total)	EPA 524.2	10088809	Other Regulated Contaminants	7/25/2020
1190	Zinc	EPA 200.8	10014605	Secondary Inorganic Contaminants	7/25/2020

Ron DeSantis
Governor

Laboratory Scope of Accreditation

Attachment to Certificate #: E87775-50, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E87775** **EPA Lab Code:** **IN00035** **(574) 233-4777**

E87775
Eurofins Eaton Analytical, LLC - South Bend
110 South Hill Street
South Bend, IN 46617

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
2510	Cryptosporidium	EPA 1623	10236609	Microbiology	7/25/2020
2545	Giardia	EPA 1623	10236609	Microbiology	7/25/2020

State of Florida
Department of Health, Bureau of Public Health Laboratories
This is to certify that

E871007

SGS AXYS ANALYTICAL SERVICES LTD.
2045 MILLS ROAD WEST
SIDNEY, BC V8L 5X2

has complied with Florida Administrative Code 64E-1,
for the examination of environmental samples in the following categories

NON-POTABLE WATER - EXTRACTABLE ORGANICS, NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - PESTICIDES-HERBICIDES-PCB'S, SOLID AND CHEMICAL MATERIALS - EXTRACTABLE ORGANICS, SOLID AND CHEMICAL MATERIALS - GENERAL CHEMISTRY, SOLID AND CHEMICAL MATERIALS - PESTICIDES-HERBICIDES-PCB'S, BIOLOGICAL TISSUE - EXTRACTABLE ORGANICS, BIOLOGICAL TISSUE - PESTICIDES-HERBICIDES-PCB'S

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Public Health Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

Date Issued: July 01, 2024   Expiration Date: June 30, 2025

Marie-Claire Rowlinson, PhD, D(ABMM)
Bureau of Public Health Laboratories
DH Form 1697, 7/04
NON-TRANSFERABLE   E871007-44-07/01/2024
Supersedes all previously issued certificates

Ron DeSantis
Governor

Laboratory Scope of Accreditation

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613	10120408	Extractable Organics	1/1/2007
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613	10120408	Extractable Organics	1/1/2007
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	EPA 1613	10120408	Extractable Organics	1/1/2007
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	EPA 1613	10120408	Extractable Organics	1/1/2007
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	EPA 1613	10120408	Extractable Organics	1/1/2007
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9453	1,2,3,4,7,8-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9453	1,2,3,4,7,8-Hxcdd	EPA 1613	10120408	Extractable Organics	1/1/2007
9453	1,2,3,4,7,8-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9453	1,2,3,4,7,8-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9453	1,2,3,4,7,8-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9471	1,2,3,4,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9471	1,2,3,4,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	1/1/2007
9471	1,2,3,4,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9471	1,2,3,4,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9471	1,2,3,4,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9456	1,2,3,6,7,8-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9456	1,2,3,6,7,8-Hxcdd	EPA 1613	10120408	Extractable Organics	1/1/2007
9456	1,2,3,6,7,8-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9456	1,2,3,6,7,8-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9456	1,2,3,6,7,8-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9474	1,2,3,6,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9474	1,2,3,6,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	1/1/2007
9474	1,2,3,6,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9474	1,2,3,6,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9474	1,2,3,6,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9459	1,2,3,7,8,9-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9459	1,2,3,7,8,9-Hxcdd	EPA 1613	10120408	Extractable Organics	1/1/2007
9459	1,2,3,7,8,9-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9459	1,2,3,7,8,9-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9459	1,2,3,7,8,9-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9477	1,2,3,7,8,9-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9477	1,2,3,7,8,9-Hxcdf	EPA 1613	10120408	Extractable Organics	1/1/2007
9477	1,2,3,7,8,9-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9477	1,2,3,7,8,9-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9477	1,2,3,7,8,9-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9540	1,2,3,7,8-Pecdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9540	1,2,3,7,8-Pecdd	EPA 1613	10120408	Extractable Organics	1/1/2007
9540	1,2,3,7,8-Pecdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9540	1,2,3,7,8-Pecdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9540	1,2,3,7,8-Pecdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9543	1,2,3,7,8-Pecdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9543	1,2,3,7,8-Pecdf	EPA 1613	10120408	Extractable Organics	1/1/2007
9543	1,2,3,7,8-Pecdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9543	1,2,3,7,8-Pecdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9543	1,2,3,7,8-Pecdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

Ron DeSantis
Governor

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9173	2,2',3-Trichlorobiphenyl (BZ 16)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9173	2,2',3-Trichlorobiphenyl (BZ 16)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9185	2,2',4-Trichlorobiphenyl (BZ 17)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9185	2,2',4-Trichlorobiphenyl (BZ 17)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8930	2,2',5-Trichlorobiphenyl (BZ 18)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8930	2,2',5-Trichlorobiphenyl (BZ 18)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9188	2,2',6-Trichlorobiphenyl (BZ 19)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9188	2,2',6-Trichlorobiphenyl (BZ 19)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9189	2,2'-Dichlorobiphenyl (BZ 4)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9189	2,2'-Dichlorobiphenyl (BZ 4)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9480	2,3,4,6,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9480	2,3,4,6,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	1/1/2007
9480	2,3,4,6,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9480	2,3,4,6,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9480	2,3,4,6,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9549	2,3,4,7,8-Pecdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9549	2,3,4,7,8-Pecdf	EPA 1613	10120408	Extractable Organics	1/1/2007
9549	2,3,4,7,8-Pecdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9549	2,3,4,7,8-Pecdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9549	2,3,4,7,8-Pecdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9240	2,3',4-Trichlorobihenyl (BZ 25)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9239	2,3',4'-Trichlorobihenyl (BZ 33)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9239	2,3',4'-Trichlorobihenyl (BZ 33)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9238	2,3,4-Trichlorobiphenyl (BZ 21)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9238	2,3,4-Trichlorobiphenyl (BZ 21)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9245	2,3,5-Trichlorobihenyl (BZ 23)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9245	2,3,5-Trichlorobihenyl (BZ 23)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9246	2,3',5'-Trichlorobihenyl (BZ 34)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9246	2,3',5'-Trichlorobihenyl (BZ 34)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8935	2,3',5-Trichlorobiphenyl (BZ 26)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8935	2,3',5-Trichlorobiphenyl (BZ 26)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9248	2,3',6-Trichlorobihenyl (BZ 27)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9248	2,3',6-Trichlorobihenyl (BZ 27)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9247	2,3,6-Trichlorobiphenyl (BZ 24)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9247	2,3,6-Trichlorobiphenyl (BZ 24)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	EPA 1613	10120408	Extractable Organics	1/1/2007
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9612	2,3,7,8-TCDF	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9612	2,3,7,8-TCDF	EPA 1613	10120408	Extractable Organics	1/1/2007
9612	2,3,7,8-TCDF	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9612	2,3,7,8-TCDF	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9612	2,3,7,8-TCDF	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8920	2,3-Dichlorobiphenyl (BZ 5)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9249	2,3'-Dichlorobiphenyl (BZ 6)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9249	2,3'-Dichlorobiphenyl (BZ 6)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9253	2,4,5-Trichlorobiphenyl (BZ 29)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9253	2,4,5-Trichlorobiphenyl (BZ 29)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8940	2,4',5-Trichlorobiphenyl (BZ 31)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8940	2,4',5-Trichlorobiphenyl (BZ 31)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9254	2,4,6-Trichlorobihenyl (BZ 30)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9254	2,4,6-Trichlorobihenyl (BZ 30)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9255	2,4',6-Trichlorobihenyl (BZ 32)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9255	2,4',6-Trichlorobihenyl (BZ 32)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8580	2,4'-DDD	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	EPA 625	10107401	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8580	2,4'-DDD	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
8585	2,4'-DDE	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	EPA 625	10107401	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8585	2,4'-DDE	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
8590	2,4'-DDT	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	EPA 625	10107401	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8590	2,4'-DDT	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9257	2,4-Dichlorobiphenyl (BZ 7)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9256	2,4'-Dichlorobiphenyl (BZ 8)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9256	2,4'-Dichlorobiphenyl (BZ 8)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9258	2,5-Dichlorobiphenyl (BZ 9)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9258	2,5-Dichlorobiphenyl (BZ 9)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9259	2,6-Dichlorophenyl (BZ 10)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9259	2,6-Dichlorophenyl (BZ 10)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8915	2-Chlorobiphenyl (BZ 1)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8915	2-Chlorobiphenyl (BZ 1)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9340	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9340	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
9338	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9338	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
6385	2-Methylnaphthalene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6385	2-Methylnaphthalene	EPA 8270E	10242543	Extractable Organics	3/31/2023
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9263	3,3',4-Trichlorobihenyl (BZ 35)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9263	3,3',4-Trichlorobihenyl (BZ 35)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9265	3,3',5-Trichlorobihenyl (BZ 36)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9265	3,3',5-Trichlorobihenyl (BZ 36)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8925	3,3'-Dichlorobiphenyl (BZ 11)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8925	3,3'-Dichlorobiphenyl (BZ 11)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9267	3,4,5-Trichlorobihenyl (BZ 38)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9267	3,4,5-Trichlorobihenyl (BZ 38)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9268	3,4',5-Trichlorobihenyl (BZ 39)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9268	3,4',5-Trichlorobihenyl (BZ 39)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9270	3,4-Dichlorobiphenyl (BZ 12)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9270	3,4-Dichlorobiphenyl (BZ 12)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9269	3,4'-Dichlorobiphenyl (BZ 13)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9269	3,4'-Dichlorobiphenyl (BZ 13)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9271	3,5-Dichlorobiphenyl (BZ 14)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9271	3,5-Dichlorobiphenyl (BZ 14)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9272	3-Chlorobiphenyl (BZ 2)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9272	3-Chlorobiphenyl (BZ 2)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9353	4,4,5,5,6,6,6-Heptafluorohexanoic Acid (3:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9353	4,4,5,5,6,6,6-Heptafluorohexanoic Acid (3:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
7355	4,4'-DDD	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7355	4,4'-DDD	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7355	4,4'-DDD	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7355	4,4'-DDD	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7355	4,4'-DDD	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7355	4,4'-DDD	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7360	4,4'-DDE	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7360	4,4'-DDE	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7360	4,4'-DDE	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7360	4,4'-DDE	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7360	4,4'-DDE	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7360	4,4'-DDE	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7365	4,4'-DDT	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7365	4,4'-DDT	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7365	4,4'-DDT	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7365	4,4'-DDT	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7365	4,4'-DDT	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7365	4,4'-DDT	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9273	4,4'-Dichlorobiphenyl (BZ 15)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9274	4-Chlorobiphenyl (BZ 3)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9274	4-Chlorobiphenyl (BZ 3)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	EPA 1633	10123463	Extractable Organics	1/31/2024
5500	Acenaphthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5500	Acenaphthene	EPA 1625	10121809	Extractable Organics	3/13/2014
5505	Acenaphthylene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5505	Acenaphthylene	EPA 1625	10121809	Extractable Organics	3/13/2014
7025	Aldrin	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7025	Aldrin	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7025	Aldrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7025	Aldrin	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7025	Aldrin	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7025	Aldrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7240	alpha-Chlordane	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7240	alpha-Chlordane	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7240	alpha-Chlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7240	alpha-Chlordane	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7240	alpha-Chlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
5555	Anthracene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5555	Anthracene	EPA 1625	10121809	Extractable Organics	3/13/2014
8880	Aroclor-1016 (PCB-1016)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8885	Aroclor-1221 (PCB-1221)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8890	Aroclor-1232 (PCB-1232)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8895	Aroclor-1242 (PCB-1242)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8895	Aroclor-1242 (PCB-1242)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8895	Aroclor-1242 (PCB-1242)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8895	Aroclor-1242 (PCB-1242)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8895	Aroclor-1242 (PCB-1242)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8900	Aroclor-1248 (PCB-1248)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8905	Aroclor-1254 (PCB-1254)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
8910	Aroclor-1260 (PCB-1260)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
5575	Benzo(a)anthracene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5575	Benzo(a)anthracene	EPA 1625	10121809	Extractable Organics	3/13/2014
5580	Benzo(a)pyrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5580	Benzo(a)pyrene	EPA 1625	10121809	Extractable Organics	3/13/2014
5585	Benzo(b)fluoranthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5585	Benzo(b)fluoranthene	EPA 1625	10121809	Extractable Organics	3/13/2014
5590	Benzo(g,h,i)perylene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5590	Benzo(g,h,i)perylene	EPA 1625	10121809	Extractable Organics	3/13/2014
5600	Benzo(k)fluoranthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5600	Benzo(k)fluoranthene	EPA 1625	10121809	Extractable Organics	3/13/2014
7115	beta-BHC (beta-Hexachlorocyclohexane)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7115	beta-BHC (beta-Hexachlorocyclohexane)	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7115	beta-BHC (beta-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7115	beta-BHC (beta-Hexachlorocyclohexane)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7115	beta-BHC (beta-Hexachlorocyclohexane)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7115	beta-BHC (beta-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7250	Chlordane (tech.)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7250	Chlordane (tech.)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
5855	Chrysene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5855	Chrysene	EPA 1625	10121809	Extractable Organics	3/13/2014
7925	cis-Nonachlor	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
7925	cis-Nonachlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
7925	cis-Nonachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7925	cis-Nonachlor	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7925	cis-Nonachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9105	Decachlorobiphenyl (BZ 209)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9105	Decachlorobiphenyl (BZ 209)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
7105	delta-BHC	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7105	delta-BHC	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7105	delta-BHC	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7105	delta-BHC	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7105	delta-BHC	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7105	delta-BHC	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
5895	Dibenz(a,h)anthracene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5895	Dibenz(a,h)anthracene	EPA 1625	10121809	Extractable Organics	3/13/2014
7470	Dieldrin	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7470	Dieldrin	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7470	Dieldrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7470	Dieldrin	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7470	Dieldrin	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7470	Dieldrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9387	Dioxin	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
7510	Endosulfan I	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7510	Endosulfan I	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7510	Endosulfan I	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7510	Endosulfan I	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7510	Endosulfan I	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7510	Endosulfan I	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7515	Endosulfan II	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7515	Endosulfan II	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7515	Endosulfan II	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7515	Endosulfan II	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7515	Endosulfan II	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7515	Endosulfan II	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7520	Endosulfan sulfate	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7520	Endosulfan sulfate	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7520	Endosulfan sulfate	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7520	Endosulfan sulfate	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7520	Endosulfan sulfate	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7520	Endosulfan sulfate	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7540	Endrin	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7540	Endrin	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7540	Endrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7540	Endrin	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7540	Endrin	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7540	Endrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7530	Endrin aldehyde	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7530	Endrin aldehyde	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7530	Endrin aldehyde	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7530	Endrin aldehyde	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7530	Endrin aldehyde	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7530	Endrin aldehyde	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7535	Endrin ketone	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7535	Endrin ketone	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
7535	Endrin ketone	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7535	Endrin ketone	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
6265	Fluoranthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6265	Fluoranthene	EPA 1625	10121809	Extractable Organics	3/13/2014
6270	Fluorene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6270	Fluorene	EPA 1625	10121809	Extractable Organics	3/13/2014
1730	Fluoride	EPA 1621	10121014	General Chemistry	1/31/2024
1730	Fluoride	SGS AXYS MLA-119 AOF	60033891	General Chemistry	9/29/2023
1730	Fluoride	SGS AXYS MLA-119 EOF	60033892	General Chemistry	9/29/2023
1730	Fluoride	SGS AXYS MLA-119 TF	60033893	General Chemistry	9/29/2023
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7245	gamma-Chlordane	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7245	gamma-Chlordane	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7245	gamma-Chlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7245	gamma-Chlordane	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7245	gamma-Chlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7685	Heptachlor	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7685	Heptachlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7685	Heptachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7685	Heptachlor	EPA 625	10107401	Pesticides-Herbicides-PCB's	3/13/2014
7685	Heptachlor	EPA 625.1	10300024	Pesticides-Herbicides-PCB's	11/26/2018
7685	Heptachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7690	Heptachlor epoxide	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7690	Heptachlor epoxide	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7690	Heptachlor epoxide	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7690	Heptachlor epoxide	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7690	Heptachlor epoxide	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7690	Heptachlor epoxide	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
6275	Hexachlorobenzene	AXYS SOP MLA-007 / GC-MS	60001801	Extractable Organics	3/13/2014
6275	Hexachlorobenzene	AXYS SOP MLA-028 / GC-HRMS	60001867	Extractable Organics	3/13/2014
6275	Hexachlorobenzene	EPA 1625	10121809	Extractable Organics	3/13/2014
6275	Hexachlorobenzene	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
6275	Hexachlorobenzene	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	EPA 1633	10123463	Extractable Organics	1/31/2024
9438	Hpcdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9438	Hpcdd, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9438	Hpcdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9438	Hpcdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9438	Hpcdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9444	Hpcdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9444	Hpcdf, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9444	Hpcdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9444	Hpcdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9444	Hpcdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9468	Hxcdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9468	Hxcdd, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9468	Hxcdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9468	Hxcdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9468	Hxcdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9483	Hxcdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9483	Hxcdf, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9483	Hxcdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9483	Hxcdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9483	Hxcdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
6315	Indeno(1,2,3-cd)pyrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6315	Indeno(1,2,3-cd)pyrene	EPA 1625	10121809	Extractable Organics	3/13/2014
7810	Methoxychlor	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7810	Methoxychlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7810	Methoxychlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7810	Methoxychlor	EPA 608	10103603	Pesticides-Herbicides-PCB's	3/13/2014
7810	Methoxychlor	EPA 608.3	10296614	Pesticides-Herbicides-PCB's	11/26/2018
7810	Methoxychlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7870	Mirex	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7870	Mirex	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7870	Mirex	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7870	Mirex	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7870	Mirex	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
5005	Naphthalene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5005	Naphthalene	EPA 1625	10121809	Extractable Organics	3/13/2014
9395	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9395	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9431	N-ethylperfluorooctane sulfonamido ethanol (EtFOSE)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9431	N-ethylperfluorooctane sulfonamido ethanol (EtFOSE)	EPA 1633	10123463	Extractable Organics	1/31/2024
9433	N-Methylperfluorooctane sulfonamide (MeFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9433	N-Methylperfluorooctane sulfonamide (MeFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	EPA 1633	10123463	Extractable Organics	1/31/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
3890	Oxychlordane	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
3890	Oxychlordane	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
3890	Oxychlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
3890	Oxychlordane	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
3890	Oxychlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
8875	PCBs, as congeners	EPA 1668	10129201	Pesticides-Herbicides-PCB's	9/15/2023
8875	PCBs, as congeners	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	9/15/2023
8875	PCBs, as congeners	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8875	PCBs, as congeners	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9555	Pecdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9555	Pecdd, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9555	Pecdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9555	Pecdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9555	Pecdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9552	Pecdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9552	Pecdf, total	EPA 1613	10120408	Extractable Organics	1/1/2007

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Non-Potable Water**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9552	Pecdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9552	Pecdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9552	Pecdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6911	Perfluorobutane Sulfonate (PFBS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6918	Perfluorobutane Sulfonic Acid (PFBS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6919	Perfluorobutanoate (PFBA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6915	Perfluorobutanoic Acid (PFBA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9562	Perfluorodecane sulfonate (PFDS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6920	Perfluorodecane Sulfonic Acid (PFDS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6921	Perfluorodecanoate (PFDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6905	Perfluorodecanoic Acid (PFDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6922	Perfluorododecane Sulfonate (PFDoS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6923	Perfluorododecane Sulfonic Acid (PFDoS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6924	Perfluorododecanoate (PFDoA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6903	Perfluorododecanoic Acid (PFDoA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6925	Perfluoroheptane Sulfonate (PFHpS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9470	Perfluoroheptane Sulfonic Acid (PFHpS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6926	Perfluoroheptanoate (PFHpA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6908	Perfluoroheptanoic Acid (PFHpA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6927	Perfluorohexane Sulfonic Acid (PFHxS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6927	Perfluorohexane Sulfonic Acid (PFHxS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6928	Perfluorohexanoate (PFHxA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6913	Perfluorohexanoic Acid (PFHxA)	EPA 1633	10123463	Extractable Organics	1/31/2024

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9464	Perfluorononane Sulfonate (PFNS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6929	Perfluorononane Sulfonic Acid (PFNS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6930	Perfluorononanoate (PFNA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6906	Perfluorononanoic Acid (PFNA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6917	Perfluorooctane sulfonamide (PFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9665	Perfluoro-octane Sulfonamide (PFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6909	Perfluoro-octane Sulfonate (PFOS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6931	Perfluorooctane sulfonic acid (PFOS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6932	Perfluoro-octanoate (PFOA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6912	Perfluorooctanoic Acid (PFOA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6933	Perfluoropentane Sulfonate (PFPeS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6934	Perfluoropentane Sulfonic Acid (PFPeS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6935	Perfluoropentanoate (PFPeA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6914	Perfluoropentanoic Acid (PFPeA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6902	Perfluorotetradecanoic acid (PFTDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6902	Perfluorotetradecanoic acid (PFTDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9563	Perfluorotridecanoic acid (PFTrDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9563	Perfluorotridecanoic acid (PFTrDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6944	Perfluoroundecanoate (PFUnDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6904	Perfluoroundecanoic acid (PFUnDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6615	Phenanthrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6615	Phenanthrene	EPA 1625	10121809	Extractable Organics	3/13/2014
6665	Pyrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6665	Pyrene	EPA 1625	10121809	Extractable Organics	3/13/2014
9609	TCDD, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9609	TCDD, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9609	TCDD, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9609	TCDD, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9609	TCDD, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Non-Potable Water

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9615	TCDF, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9615	TCDF, total	EPA 1613	10120408	Extractable Organics	1/1/2007
9615	TCDF, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9615	TCDF, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9615	TCDF, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
8876	Total Dichlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8877	Total Heptachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8888	Total Hexachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8889	Total Monochlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8891	Total Nonachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8892	Total Octachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8896	Total pentachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8893	Total Tetrachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8894	Total Trichlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
7910	trans-Nonachlor	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
7910	trans-Nonachlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
7910	trans-Nonachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7910	trans-Nonachlor	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7910	trans-Nonachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613	10120408	Extractable Organics	10/16/2019
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613	10120408	Extractable Organics	10/16/2019
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	EPA 1613	10120408	Extractable Organics	10/16/2019
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	EPA 1613	10120408	Extractable Organics	10/16/2019
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	EPA 1613	10120408	Extractable Organics	10/16/2019
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9453	1,2,3,4,7,8-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9453	1,2,3,4,7,8-Hxcdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9453	1,2,3,4,7,8-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9453	1,2,3,4,7,8-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9453	1,2,3,4,7,8-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9471	1,2,3,4,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9471	1,2,3,4,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9471	1,2,3,4,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9471	1,2,3,4,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9471	1,2,3,4,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9456	1,2,3,6,7,8-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9456	1,2,3,6,7,8-Hxcdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9456	1,2,3,6,7,8-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9456	1,2,3,6,7,8-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9456	1,2,3,6,7,8-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9474	1,2,3,6,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9474	1,2,3,6,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9474	1,2,3,6,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9474	1,2,3,6,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9474	1,2,3,6,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9459	1,2,3,7,8,9-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9459	1,2,3,7,8,9-Hxcdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9459	1,2,3,7,8,9-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9459	1,2,3,7,8,9-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9459	1,2,3,7,8,9-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9477	1,2,3,7,8,9-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9477	1,2,3,7,8,9-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9477	1,2,3,7,8,9-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9477	1,2,3,7,8,9-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9477	1,2,3,7,8,9-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9540	1,2,3,7,8-Pecdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9540	1,2,3,7,8-Pecdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9540	1,2,3,7,8-Pecdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9540	1,2,3,7,8-Pecdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9540	1,2,3,7,8-Pecdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9543	1,2,3,7,8-Pecdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9543	1,2,3,7,8-Pecdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9543	1,2,3,7,8-Pecdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9543	1,2,3,7,8-Pecdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9543	1,2,3,7,8-Pecdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

Ron DeSantis
Governor

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9173	2,2',3-Trichlorobiphenyl (BZ 16)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9173	2,2',3-Trichlorobiphenyl (BZ 16)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9185	2,2',4-Trichlorobiphenyl (BZ 17)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9185	2,2',4-Trichlorobiphenyl (BZ 17)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8930	2,2',5-Trichlorobiphenyl (BZ 18)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8930	2,2',5-Trichlorobiphenyl (BZ 18)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9188	2,2',6-Trichlorobiphenyl (BZ 19)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9188	2,2',6-Trichlorobiphenyl (BZ 19)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9189	2,2'-Dichlorobiphenyl (BZ 4)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9189	2,2'-Dichlorobiphenyl (BZ 4)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9480	2,3,4,6,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9480	2,3,4,6,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9480	2,3,4,6,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9480	2,3,4,6,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9480	2,3,4,6,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9549	2,3,4,7,8-Pecdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9549	2,3,4,7,8-Pecdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9549	2,3,4,7,8-Pecdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9549	2,3,4,7,8-Pecdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9549	2,3,4,7,8-Pecdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9240	2,3',4-Trichlorobihenyl (BZ 25)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9239	2,3',4'-Trichlorobihenyl (BZ 33)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9239	2,3',4'-Trichlorobihenyl (BZ 33)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9238	2,3,4-Trichlorobiphenyl (BZ 21)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9238	2,3,4-Trichlorobiphenyl (BZ 21)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9245	2,3,5-Trichlorobihenyl (BZ 23)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9245	2,3,5-Trichlorobihenyl (BZ 23)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9246	2,3',5'-Trichlorobihenyl (BZ 34)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9246	2,3',5'-Trichlorobihenyl (BZ 34)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8935	2,3',5-Trichlorobiphenyl (BZ 26)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8935	2,3',5-Trichlorobiphenyl (BZ 26)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9248	2,3',6-Trichlorobihenyl (BZ 27)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9248	2,3',6-Trichlorobihenyl (BZ 27)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9247	2,3,6-Trichlorobiphenyl (BZ 24)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9247	2,3,6-Trichlorobiphenyl (BZ 24)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	EPA 1613	10120408	Extractable Organics	10/16/2019
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9612	2,3,7,8-TCDF	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9612	2,3,7,8-TCDF	EPA 1613	10120408	Extractable Organics	10/16/2019
9612	2,3,7,8-TCDF	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9612	2,3,7,8-TCDF	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9612	2,3,7,8-TCDF	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8920	2,3-Dichlorobiphenyl (BZ 5)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9249	2,3'-Dichlorobiphenyl (BZ 6)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9249	2,3'-Dichlorobiphenyl (BZ 6)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9253	2,4,5-Trichlorobiphenyl (BZ 29)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9253	2,4,5-Trichlorobiphenyl (BZ 29)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8940	2,4',5-Trichlorobiphenyl (BZ 31)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8940	2,4',5-Trichlorobiphenyl (BZ 31)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9254	2,4,6-Trichlorobihenyl (BZ 30)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9254	2,4,6-Trichlorobihenyl (BZ 30)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9255	2,4',6-Trichlorobihenyl (BZ 32)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9255	2,4',6-Trichlorobihenyl (BZ 32)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8580	2,4'-DDD	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
8580	2,4'-DDD	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8580	2,4'-DDD	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
8585	2,4'-DDE	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
8585	2,4'-DDE	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8585	2,4'-DDE	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
8590	2,4'-DDT	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
8590	2,4'-DDT	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8590	2,4'-DDT	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9257	2,4-Dichlorobiphenyl (BZ 7)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9256	2,4'-Dichlorobiphenyl (BZ 8)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9256	2,4'-Dichlorobiphenyl (BZ 8)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9258	2,5-Dichlorobiphenyl (BZ 9)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9258	2,5-Dichlorobiphenyl (BZ 9)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9259	2,6-Dichlorophenyl (BZ 10)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9259	2,6-Dichlorophenyl (BZ 10)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8915	2-Chlorobiphenyl (BZ 1)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8915	2-Chlorobiphenyl (BZ 1)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9340	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9340	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
9338	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9338	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6385	2-Methylnaphthalene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	8/31/2021
6385	2-Methylnaphthalene	EPA 8270E	10242543	Extractable Organics	3/31/2023

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9263	3,3',4-Trichlorobihenyl (BZ 35)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9263	3,3',4-Trichlorobihenyl (BZ 35)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9265	3,3',5-Trichlorobihenyl (BZ 36)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9265	3,3',5-Trichlorobihenyl (BZ 36)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8925	3,3'-Dichlorobiphenyl (BZ 11)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8925	3,3'-Dichlorobiphenyl (BZ 11)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019

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**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9267	3,4,5-Trichlorobihenyl (BZ 38)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9267	3,4,5-Trichlorobihenyl (BZ 38)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9268	3,4',5-Trichlorobihenyl (BZ 39)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9268	3,4',5-Trichlorobihenyl (BZ 39)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9270	3,4-Dichlorobiphenyl (BZ 12)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9270	3,4-Dichlorobiphenyl (BZ 12)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9269	3,4'-Dichlorobiphenyl (BZ 13)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9269	3,4'-Dichlorobiphenyl (BZ 13)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9271	3,5-Dichlorobiphenyl (BZ 14)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9271	3,5-Dichlorobiphenyl (BZ 14)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9272	3-Chlorobiphenyl (BZ 2)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9272	3-Chlorobiphenyl (BZ 2)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9353	4,4,5,5,6,6,6-Heptafluorohexanoic Acid (3:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9353	4,4,5,5,6,6,6-Heptafluorohexanoic Acid (3:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
7355	4,4'-DDD	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7355	4,4'-DDD	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7355	4,4'-DDD	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7355	4,4'-DDD	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7355	4,4'-DDD	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7360	4,4'-DDE	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7360	4,4'-DDE	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7360	4,4'-DDE	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7360	4,4'-DDE	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7360	4,4'-DDE	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7365	4,4'-DDT	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7365	4,4'-DDT	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7365	4,4'-DDT	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7365	4,4'-DDT	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7365	4,4'-DDT	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9273	4,4'-Dichlorobiphenyl (BZ 15)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9274	4-Chlorobiphenyl (BZ 3)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9274	4-Chlorobiphenyl (BZ 3)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	EPA 1633	10123463	Extractable Organics	1/31/2024
5500	Acenaphthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5500	Acenaphthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5505	Acenaphthylene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5505	Acenaphthylene	EPA 8270E	10242543	Extractable Organics	3/31/2023
7025	Aldrin	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7025	Aldrin	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7025	Aldrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7025	Aldrin	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7025	Aldrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015

Ron DeSantis
Governor

Laboratory Scope of Accreditation

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7240	alpha-Chlordane	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7240	alpha-Chlordane	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7240	alpha-Chlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7240	alpha-Chlordane	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7240	alpha-Chlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
5555	Anthracene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5555	Anthracene	EPA 8270E	10242543	Extractable Organics	3/31/2023
8880	Aroclor-1016 (PCB-1016)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8880	Aroclor-1016 (PCB-1016)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8885	Aroclor-1221 (PCB-1221)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8885	Aroclor-1221 (PCB-1221)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8890	Aroclor-1232 (PCB-1232)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8890	Aroclor-1232 (PCB-1232)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8895	Aroclor-1242 (PCB-1242)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8895	Aroclor-1242 (PCB-1242)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8895	Aroclor-1242 (PCB-1242)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8895	Aroclor-1242 (PCB-1242)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8900	Aroclor-1248 (PCB-1248)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8900	Aroclor-1248 (PCB-1248)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8905	Aroclor-1254 (PCB-1254)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8905	Aroclor-1254 (PCB-1254)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
8910	Aroclor-1260 (PCB-1260)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
8910	Aroclor-1260 (PCB-1260)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
5575	Benzo(a)anthracene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5575	Benzo(a)anthracene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5580	Benzo(a)pyrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5580	Benzo(a)pyrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5585	Benzo(b)fluoranthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5585	Benzo(b)fluoranthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5590	Benzo(g,h,i)perylene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5590	Benzo(g,h,i)perylene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5600	Benzo(k)fluoranthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5600	Benzo(k)fluoranthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
7115	beta-BHC (beta-Hexachlorocyclohexane)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7115	beta-BHC (beta-Hexachlorocyclohexane)	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7115	beta-BHC (beta-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7115	beta-BHC (beta-Hexachlorocyclohexane)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7115	beta-BHC (beta-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7250	Chlordane (tech.)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7250	Chlordane (tech.)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
5855	Chrysene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5855	Chrysene	EPA 8270E	10242543	Extractable Organics	3/31/2023
7925	cis-Nonachlor	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
7925	cis-Nonachlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7925	cis-Nonachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7925	cis-Nonachlor	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7925	cis-Nonachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9105	Decachlorobiphenyl (BZ 209)	AXYS SOP MLA-010 / GC-HRMS	60001823	Pesticides-Herbicides-PCB's	3/13/2014
9105	Decachlorobiphenyl (BZ 209)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	3/13/2014
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
7105	delta-BHC	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7105	delta-BHC	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7105	delta-BHC	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7105	delta-BHC	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7105	delta-BHC	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
5895	Dibenz(a,h)anthracene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5895	Dibenz(a,h)anthracene	EPA 8270E	10242543	Extractable Organics	3/31/2023
7470	Dieldrin	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7470	Dieldrin	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7470	Dieldrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7470	Dieldrin	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7470	Dieldrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9387	Dioxin	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
7510	Endosulfan I	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7510	Endosulfan I	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7510	Endosulfan I	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7510	Endosulfan I	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7510	Endosulfan I	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7515	Endosulfan II	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7515	Endosulfan II	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7515	Endosulfan II	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7515	Endosulfan II	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7515	Endosulfan II	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7520	Endosulfan sulfate	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7520	Endosulfan sulfate	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7520	Endosulfan sulfate	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7520	Endosulfan sulfate	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7520	Endosulfan sulfate	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7540	Endrin	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7540	Endrin	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7540	Endrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7540	Endrin	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7540	Endrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7530	Endrin aldehyde	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7530	Endrin aldehyde	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7530	Endrin aldehyde	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7530	Endrin aldehyde	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7530	Endrin aldehyde	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7535	Endrin ketone	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7535	Endrin ketone	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7535	Endrin ketone	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7535	Endrin ketone	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7535	Endrin ketone	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
6265	Fluoranthene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6265	Fluoranthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6270	Fluorene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6270	Fluorene	EPA 8270E	10242543	Extractable Organics	3/31/2023
1730	Fluoride	SGS AXYS MLA-119 EOF	60033892	General Chemistry	9/29/2023
1730	Fluoride	SGS AXYS MLA-119 TF	60033893	General Chemistry	9/29/2023

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7245	gamma-Chlordane	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7245	gamma-Chlordane	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7245	gamma-Chlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7245	gamma-Chlordane	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7245	gamma-Chlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7685	Heptachlor	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014
7685	Heptachlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7685	Heptachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7685	Heptachlor	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7685	Heptachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7690	Heptachlor epoxide	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7690	Heptachlor epoxide	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7690	Heptachlor epoxide	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7690	Heptachlor epoxide	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7690	Heptachlor epoxide	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
6275	Hexachlorobenzene	AXYS SOP MLA-007 / GC-MS	60001801	Extractable Organics	3/13/2014
6275	Hexachlorobenzene	AXYS SOP MLA-028 / GC-HRMS	60001867	Extractable Organics	3/13/2014
6275	Hexachlorobenzene	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
6275	Hexachlorobenzene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6275	Hexachlorobenzene	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	EPA 1633	10123463	Extractable Organics	1/31/2024

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9438	Hpcdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9438	Hpcdd, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9438	Hpcdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9438	Hpcdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9438	Hpcdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9444	Hpcdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9444	Hpcdf, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9444	Hpcdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9444	Hpcdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9444	Hpcdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9468	Hxcdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9468	Hxcdd, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9468	Hxcdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9468	Hxcdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9468	Hxcdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9483	Hxcdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9483	Hxcdf, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9483	Hxcdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9483	Hxcdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9483	Hxcdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
6315	Indeno(1,2,3-cd)pyrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6315	Indeno(1,2,3-cd)pyrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
7810	Methoxychlor	AXYS SOP MLA-007 / GC-ECD	60001812	Pesticides-Herbicides-PCB's	2/23/2015
7810	Methoxychlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7810	Methoxychlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7810	Methoxychlor	EPA 8081B	10178811	Pesticides-Herbicides-PCB's	3/31/2023
7810	Methoxychlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
7870	Mirex	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	3/13/2014

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7870	Mirex	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	3/13/2014
7870	Mirex	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7870	Mirex	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
7870	Mirex	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
5005	Naphthalene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
5005	Naphthalene	EPA 8270E	10242543	Extractable Organics	3/31/2023
9395	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9395	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9431	N-ethylperfluorooctane sulfonamido ethanol (EtFOSE)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9431	N-ethylperfluorooctane sulfonamido ethanol (EtFOSE)	EPA 1633	10123463	Extractable Organics	1/31/2024
9433	N-Methylperfluorooctane sulfonamide (MeFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9433	N-Methylperfluorooctane sulfonamide (MeFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	EPA 1633	10123463	Extractable Organics	1/31/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
3890	Oxychlordane	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
3890	Oxychlordane	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
3890	Oxychlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
3890	Oxychlordane	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023
3890	Oxychlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019
8875	PCBs, as congeners	EPA 1668	10129201	Pesticides-Herbicides-PCB's	9/15/2023
8875	PCBs, as congeners	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	9/15/2023

Ron DeSantis
Governor

Laboratory Scope of Accreditation

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8875	PCBs, as congeners	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	10/16/2019
8875	PCBs, as congeners	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
9555	Pecdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9555	Pecdd, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9555	Pecdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9555	Pecdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9555	Pecdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9552	Pecdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9552	Pecdf, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9552	Pecdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9552	Pecdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9552	Pecdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6911	Perfluorobutane Sulfonate (PFBS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6918	Perfluorobutane Sulfonic Acid (PFBS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6919	Perfluorobutanoate (PFBA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6915	Perfluorobutanoic Acid (PFBA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9562	Perfluorodecane sulfonate (PFDS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6920	Perfluorodecane Sulfonic Acid (PFDS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6921	Perfluorodecanoate (PFDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6905	Perfluorodecanoic Acid (PFDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6922	Perfluorododecane Sulfonate (PFDoS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6923	Perfluorododecane Sulfonic Acid (PFDoS)	EPA 1633	10123463	Extractable Organics	1/31/2024

Laboratory Scope of Accreditation

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
6924	Perfluorododecanoate (PFDoA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6903	Perfluorododecanoic Acid (PFDoA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6925	Perfluoroheptane Sulfonate (PFHpS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9470	Perfluoroheptane Sulfonic Acid (PFHpS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6926	Perfluoroheptanoate (PFHpA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6908	Perfluoroheptanoic Acid (PFHpA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6927	Perfluorohexane Sulfonic Acid (PFHxS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6927	Perfluorohexane Sulfonic Acid (PFHxS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6928	Perfluorohexanoate (PFHxA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6913	Perfluorohexanoic Acid (PFHxA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9464	Perfluorononane Sulfonate (PFNS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6929	Perfluorononane Sulfonic Acid (PFNS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6930	Perfluorononanoate (PFNA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6906	Perfluorononanoic Acid (PFNA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6917	Perfluorooctane sulfonamide (PFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9665	Perfluoro-octane Sulfonamide (PFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6909	Perfluoro-octane Sulfonate (PFOS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6931	Perfluorooctane sulfonic acid (PFOS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6932	Perfluoro-octanoate (PFOA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6912	Perfluorooctanoic Acid (PFOA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6933	Perfluoropentane Sulfonate (PFPeS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6934	Perfluoropentane Sulfonic Acid (PFPeS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6935	Perfluoropentanoate (PFPeA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6914	Perfluoropentanoic Acid (PFPeA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6902	Perfluorotetradecanoic acid (PFTDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6902	Perfluorotetradecanoic acid (PFTDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9563	Perfluorotridecanoic acid (PFTrDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9563	Perfluorotridecanoic acid (PFTrDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6944	Perfluoroundecanoate (PFUnDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6904	Perfluoroundecanoic acid (PFUnDA)	EPA 1633	10123463	Extractable Organics	1/31/2024

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Solid and Chemical Materials**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
6615	Phenanthrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6615	Phenanthrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6665	Pyrene	AXYS SOP MLA-021 / GC-MS	60001845	Extractable Organics	3/13/2014
6665	Pyrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
9609	TCDD, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9609	TCDD, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9609	TCDD, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9609	TCDD, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9609	TCDD, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9615	TCDF, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9615	TCDF, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9615	TCDF, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9615	TCDF, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9615	TCDF, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
8876	Total Dichlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8877	Total Heptachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8888	Total Hexachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8889	Total Monochlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8891	Total Nonachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8892	Total Octachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8896	Total pentachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8893	Total Tetrachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
8894	Total Trichlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	10/16/2019
7910	trans-Nonachlor	AXYS SOP MLA-007 / GC-MS	60001801	Pesticides-Herbicides-PCB's	12/17/2015
7910	trans-Nonachlor	AXYS SOP MLA-028 / GC-HRMS	60001867	Pesticides-Herbicides-PCB's	12/17/2015
7910	trans-Nonachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/17/2015
7910	trans-Nonachlor	EPA 8270E	10242543	Pesticides-Herbicides-PCB's	3/31/2023

Laboratory Scope of Accreditation

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Solid and Chemical Materials

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7910	trans-Nonachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613	10120408	Extractable Organics	10/16/2019
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613	10120408	Extractable Organics	10/16/2019
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	EPA 1613	10120408	Extractable Organics	10/16/2019
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-hpcdf)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	EPA 1613	10120408	Extractable Organics	10/16/2019
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-hpcdd)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	EPA 1613	10120408	Extractable Organics	10/16/2019
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-hpcdf)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9453	1,2,3,4,7,8-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9453	1,2,3,4,7,8-Hxcdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9453	1,2,3,4,7,8-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9453	1,2,3,4,7,8-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9453	1,2,3,4,7,8-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9471	1,2,3,4,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9471	1,2,3,4,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9471	1,2,3,4,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9471	1,2,3,4,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9471	1,2,3,4,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9456	1,2,3,6,7,8-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9456	1,2,3,6,7,8-Hxcdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9456	1,2,3,6,7,8-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9456	1,2,3,6,7,8-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9456	1,2,3,6,7,8-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9474	1,2,3,6,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9474	1,2,3,6,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9474	1,2,3,6,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9474	1,2,3,6,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9474	1,2,3,6,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9459	1,2,3,7,8,9-Hxcdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9459	1,2,3,7,8,9-Hxcdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9459	1,2,3,7,8,9-Hxcdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9459	1,2,3,7,8,9-Hxcdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9459	1,2,3,7,8,9-Hxcdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9477	1,2,3,7,8,9-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9477	1,2,3,7,8,9-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9477	1,2,3,7,8,9-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9477	1,2,3,7,8,9-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9477	1,2,3,7,8,9-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9540	1,2,3,7,8-Pecdd	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9540	1,2,3,7,8-Pecdd	EPA 1613	10120408	Extractable Organics	10/16/2019
9540	1,2,3,7,8-Pecdd	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9540	1,2,3,7,8-Pecdd	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9540	1,2,3,7,8-Pecdd	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9543	1,2,3,7,8-Pecdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9543	1,2,3,7,8-Pecdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9543	1,2,3,7,8-Pecdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9543	1,2,3,7,8-Pecdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9543	1,2,3,7,8-Pecdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9490	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic Acid (11-ClPF3OUdS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6948	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6946	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6947	1H,1H,2H,2H-Perfluoro-octanesulfonic Acid (6:2 FTS)	EPA 1633	10123463	Extractable Organics	1/31/2024
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9095	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ 206)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9090	2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ 194)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9101	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ 207)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9103	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ 195)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9102	2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ 196)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9065	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ 170)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

Laboratory Scope of Accreditation

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9104	2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ 197)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9106	2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ 171)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9020	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ 128)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9107	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ 208)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9109	2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ 198)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9108	2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ 199)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9110	2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ 172)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9111	2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ 200)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9112	2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ 201)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9113	2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ 173)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9116	2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ 174)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9115	2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ 175)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9114	2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ 177)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9118	2,2',3,3',4,5-Hexachlorobiphenyl (BZ 129)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9117	2,2',3,3',4,5'-Hexachlorobiphenyl (BZ 130)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9119	2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ 176)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9121	2,2',3,3',4,6-Hexachlorobiphenyl (BZ 131)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9120	2,2',3,3',4,6'-Hexachlorobiphenyl (BZ 132)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9122	2,2',3,3',4-Pentachlorobiphenyl (BZ 82)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9123	2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ 202)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9124	2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ 178)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9125	2,2',3,3',5,5'-Hexachlorobiphenyl (BZ 133)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9126	2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ 179)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9128	2,2',3,3',5,6-Hexachlorobiphenyl (BZ 134)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9127	2,2',3,3',5,6'-Hexachlorobiphenyl (BZ 135)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9129	2,2',3,3',5-Pentachlorobiphenyl (BZ 83)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

Laboratory Scope of Accreditation

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9130	2,2',3,3',6,6'-Hexachlorobiphenyl (BZ 136)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9131	2,2',3,3',6-Pentachlorobiphenyl (BZ 84)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9132	2,2',3,3'-Tetrachlorobiphenyl (BZ 40)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9133	2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ 203)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9134	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ 180)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9135	2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ 204)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9137	2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ 181)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9136	2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ 182)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9075	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ 183)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9138	2,2',3,4,4',5-Hexachlorobiphenyl (BZ 137)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9025	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ 138)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9139	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ 184)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9141	2,2',3,4,4',6-Hexachlorobiphenyl (BZ 139)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9140	2,2',3,4,4',6'-Hexachlorobiphenyl (BZ 140)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9142	2,2',3,4,4'-Pentachlorobiphenyl (BZ 85)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9143	2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ 185)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9080	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ 187)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9030	2,2',3,4,5,5'-Hexachlorobiphenyl (BZ 141)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9144	2,2',3,4',5,5'-Hexachlorobiphenyl (BZ 146)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9145	2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ 186)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9146	2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ 188)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9148	2,2',3,4,5,6-Hexachlorobiphenyl (BZ 142)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9152	2,2',3,4,5,6'-Hexachlorobiphenyl (BZ 143)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9150	2,2',3,4,5',6-Hexachlorobiphenyl (BZ 144)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9149	2,2',3,4',5,6-Hexachlorobiphenyl (BZ 147)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9147	2,2',3,4',5,6'-Hexachlorobiphenyl (BZ 148)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9151	2,2',3,4',5',6-Hexachlorobiphenyl (BZ 149)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

Ron DeSantis
Governor

Laboratory Scope of Accreditation

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9153	2,2',3,4,5-Pentachlorobiphenyl (BZ 86)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8975	2,2',3,4,5'-Pentachlorobiphenyl (BZ 87)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9155	2,2',3,4',5-Pentachlorobiphenyl (BZ 90)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9154	2,2',3,4',5'-Pentachlorobiphenyl (BZ 97)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9156	2,2',3,4,6,6'-Hexachlorobiphenyl (BZ 145)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9157	2,2',3,4',6,6'-Hexachlorobiphenyl (BZ 150)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9158	2,2',3,4,6-Pentachlorobiphenyl (BZ 88)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9161	2,2',3,4,6'-Pentachlorobiphenyl (BZ 89)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9160	2,2',3,4',6-Pentachlorobiphenyl (BZ 91)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9159	2,2',3,4',6'-Pentachlorobiphenyl (BZ 98)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9163	2,2',3,4-Tetrachlorobiphenyl (BZ 41)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9162	2,2',3,4'-Tetrachlorobiphenyl (BZ 42)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9035	2,2',3,5,5',6-Hexachlorobiphenyl (BZ 151)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9164	2,2',3,5,5'-Pentachlorobiphenyl (BZ 92)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9165	2,2',3,5,6,6'-Hexachlorobiphenyl (BZ 152)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9168	2,2',3,5,6-Pentachlorobiphenyl (BZ 93)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9167	2,2',3,5,6'-Pentachlorobiphenyl (BZ 94)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9166	2,2',3,5',6-Pentachlorobiphenyl (BZ 95)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9169	2,2',3,5-Tetrachlorobiphenyl (BZ 43)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8945	2,2',3,5'-Tetrachlorobiphenyl (BZ 44)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9170	2,2',3,6,6'-Pentachlorobiphenyl (BZ 96)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9172	2,2',3,6-Tetrachlorobiphenyl (BZ 45)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9171	2,2',3,6'-Tetrachlorobiphenyl (BZ 46)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9173	2,2',3-Trichlorobiphenyl (BZ 16)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9173	2,2',3-Trichlorobiphenyl (BZ 16)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9040	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ 153)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9174	2,2',4,4',5,6'-Hexachlorobiphenyl (BZ 154)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9175	2,2',4,4',5-Pentachlorobiphenyl (BZ 99)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9176	2,2',4,4',6,6'-Hexachlorobiphenyl (BZ 155)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9177	2,2',4,4',6-Pentachlorobiphenyl (BZ 100)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9178	2,2',4,4'-Tetrachlorobiphenyl (BZ 47)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8980	2,2',4,5,5'-Pentachlorobiphenyl (BZ 101)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9180	2,2',4,5,6'-Pentachlorobiphenyl (BZ 102)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9179	2,2',4,5',6-Pentachlorobiphenyl (BZ 103)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9181	2,2',4,5-Tetrachlorobiphenyl (BZ 48)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8950	2,2',4,5'-Tetrachlorobiphenyl (BZ 49)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9182	2,2',4,6,6'-Pentachlorobiphenyl (BZ 104)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9184	2,2',4,6-Tetrachlorobiphenyl (BZ 50)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9183	2,2',4,6'-Tetrachlorobiphenyl (BZ 51)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9185	2,2',4-Trichlorobiphenyl (BZ 17)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9185	2,2',4-Trichlorobiphenyl (BZ 17)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8955	2,2',5,5'-Tetrachlorobiphenyl (BZ 52)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9186	2,2',5,6'-Tetrachlorobiphenyl (BZ 53)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8930	2,2',5-Trichlorobiphenyl (BZ 18)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8930	2,2',5-Trichlorobiphenyl (BZ 18)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9187	2,2',6,6'-Tetrachlorobiphenyl (BZ 54)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9188	2,2',6-Trichlorobiphenyl (BZ 19)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9188	2,2',6-Trichlorobiphenyl (BZ 19)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9189	2,2'-Dichlorobiphenyl (BZ 4)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9189	2,2'-Dichlorobiphenyl (BZ 4)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9190	2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ 205)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ 189)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9191	2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ 190)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9192	2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ 191)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9050	2,3,3',4,4',5-Hexachlorobiphenyl (BZ 156)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9045	2,3,3',4,4',5'-Hexachlorobiphenyl (BZ 157)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9193	2,3,3',4,4',6-Hexachlorobiphenyl (BZ 158)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8985	2,3,3',4,4'-Pentachlorobiphenyl (BZ 105)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9194	2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ 192)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9195	2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ 193)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9196	2,3,3',4,5,5'-Hexachlorobiphenyl (BZ 159)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9197	2,3,3',4',5,5'-Hexachlorobiphenyl (BZ 162)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9198	2,3,3',4,5,6-Hexachlorobiphenyl (BZ 160)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9200	2,3,3',4,5',6-Hexachlorobiphenyl (BZ 161)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9199	2,3,3',4',5,6-Hexachlorobiphenyl (BZ 163)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9201	2,3,3',4',5',6-Hexachlorobiphenyl (BZ 164)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9204	2,3,3',4,5-Pentachlorobiphenyl (BZ 106)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9205	2,3,3',4',5-Pentachlorobiphenyl (BZ 107)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9203	2,3,3',4,5'-Pentachlorobiphenyl (BZ 108)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9202	2,3,3',4',5'-Pentachlorobiphenyl (BZ 122)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9206	2,3,3',4,6-Pentachlorobiphenyl (BZ 109)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8990	2,3,3',4',6-Pentachlorobiphenyl (BZ 110)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9208	2,3,3',4-Tetrachlorobiphenyl (BZ 55)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9207	2,3,3',4'-Tetrachlorobiphenyl (BZ 56)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9209	2,3,3',5,5',6-Hexachlorobiphenyl (BZ 165)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9210	2,3,3',5,5'-Pentachlorobiphenyl (BZ 111)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9211	2,3,3',5,6-Pentachlorobiphenyl (BZ 112)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9212	2,3,3',5',6-Pentachlorobiphenyl (BZ 113)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9214	2,3,3',5-Tetrachlorobiphenyl (BZ 57)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9213	2,3,3',5'-Tetrachlorobiphenyl (BZ 58)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9215	2,3,3',6-Tetrachlorobiphenyl (BZ 59)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9216	2,3,3'-Trichlorobiphenyl (BZ 20)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9055	2,3',4,4',5,5'-Hexachlorobiphenyl (BZ 167)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9217	2,3,4,4',5,6-Hexachlorobiphenyl (BZ 166)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9218	2,3',4,4',5',6-Hexachlorobiphenyl (BZ 168)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9005	2,3,4,4',5-Pentachlorobiphenyl (BZ 114)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8995	2,3',4,4',5-Pentachlorobiphenyl (BZ 118)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9000	2,3',4,4',5'-Pentachlorobiphenyl (BZ 123)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9219	2,3,4,4',6-Pentachlorobiphenyl (BZ 115)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9220	2,3',4,4',6-Pentachlorobiphenyl (BZ 119)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9221	2,3,4,4'-Tetrachlorobiphenyl (BZ 60)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8960	2,3',4,4'-Tetrachlorobiphenyl (BZ 66)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9223	2,3',4,5,5'-Pentachlorobiphenyl (BZ 120)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9222	2,3',4',5,5'-Pentachlorobiphenyl (BZ 124)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9225	2,3,4,5,6-Pentachlorobiphenyl (BZ 116)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9227	2,3,4',5,6-Pentachlorobiphenyl (BZ 117)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9226	2,3',4,5',6-Pentachlorobiphenyl (BZ 121)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9224	2,3',4',5',6-Pentachlorobiphenyl (BZ 125)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9228	2,3,4,5-Tetrachlorobiphenyl (BZ 61)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9233	2,3,4',5-Tetrachlorobiphenyl (BZ 63)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9232	2,3',4,5-Tetrachlorobiphenyl (BZ 67)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9231	2,3',4,5'-Tetrachlorobiphenyl (BZ 68)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9230	2,3',4',5-Tetrachlorobiphenyl (BZ 70)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9229	2,3',4',5'-Tetrachlorobiphenyl (BZ 76)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9480	2,3,4,6,7,8-Hxcdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9480	2,3,4,6,7,8-Hxcdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9480	2,3,4,6,7,8-Hxcdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9480	2,3,4,6,7,8-Hxcdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9480	2,3,4,6,7,8-Hxcdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9234	2,3,4,6-Tetrachlorobiphenyl (BZ 62)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9236	2,3,4',6-Tetrachlorobiphenyl (BZ 64)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9235	2,3',4,6-Tetrachlorobiphenyl (BZ 69)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9237	2,3',4',6-Tetrachlorobiphenyl (BZ 71)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9549	2,3,4,7,8-Pecdf	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9549	2,3,4,7,8-Pecdf	EPA 1613	10120408	Extractable Organics	10/16/2019
9549	2,3,4,7,8-Pecdf	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9549	2,3,4,7,8-Pecdf	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9549	2,3,4,7,8-Pecdf	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9240	2,3',4-Trichlorobihenyl (BZ 25)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9239	2,3',4'-Trichlorobihenyl (BZ 33)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9239	2,3',4'-Trichlorobihenyl (BZ 33)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9238	2,3,4-Trichlorobiphenyl (BZ 21)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9238	2,3,4-Trichlorobiphenyl (BZ 21)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9241	2,3,4'-Trichlorobiphenyl (BZ 22)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9242	2,3',5,5'-Tetrachlorobiphenyl (BZ 72)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9243	2,3,5,6-Tetrachlorobiphenyl (BZ 65)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9244	2,3',5',6-Tetrachlorobiphenyl (BZ 73)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9245	2,3,5-Trichlorobihenyl (BZ 23)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9245	2,3,5-Trichlorobihenyl (BZ 23)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9246	2,3',5'-Trichlorobihenyl (BZ 34)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9246	2,3',5'-Trichlorobihenyl (BZ 34)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8935	2,3',5-Trichlorobiphenyl (BZ 26)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8935	2,3',5-Trichlorobiphenyl (BZ 26)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9248	2,3',6-Trichlorobihenyl (BZ 27)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9248	2,3',6-Trichlorobihenyl (BZ 27)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9247	2,3,6-Trichlorobiphenyl (BZ 24)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9247	2,3,6-Trichlorobiphenyl (BZ 24)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	EPA 1613	10120408	Extractable Organics	10/16/2019
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9618	2,3,7,8-TCDD (Dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9612	2,3,7,8-TCDF	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9612	2,3,7,8-TCDF	EPA 1613	10120408	Extractable Organics	10/16/2019
9612	2,3,7,8-TCDF	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9612	2,3,7,8-TCDF	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9612	2,3,7,8-TCDF	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8920	2,3-Dichlorobiphenyl (BZ 5)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9249	2,3'-Dichlorobiphenyl (BZ 6)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9249	2,3'-Dichlorobiphenyl (BZ 6)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9250	2,4,4',5-Tetrachlorobiphenyl (BZ 74)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9251	2,4,4',6-Tetrachlorobiphenyl (BZ 75)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9252	2,4,4'-Trichlorobiphenyl (BZ 28)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9253	2,4,5-Trichlorobiphenyl (BZ 29)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9253	2,4,5-Trichlorobiphenyl (BZ 29)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8940	2,4',5-Trichlorobiphenyl (BZ 31)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8940	2,4',5-Trichlorobiphenyl (BZ 31)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9254	2,4,6-Trichlorobihenyl (BZ 30)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9254	2,4,6-Trichlorobihenyl (BZ 30)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9255	2,4',6-Trichlorobihenyl (BZ 32)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9255	2,4',6-Trichlorobihenyl (BZ 32)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8580	2,4'-DDD	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
8580	2,4'-DDD	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Extractable Organics	10/16/2019
8580	2,4'-DDD	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
8585	2,4'-DDE	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
8585	2,4'-DDE	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Extractable Organics	10/16/2019
8585	2,4'-DDE	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
8590	2,4'-DDT	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
8590	2,4'-DDT	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Extractable Organics	10/16/2019
8590	2,4'-DDT	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9257	2,4-Dichlorobiphenyl (BZ 7)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9256	2,4'-Dichlorobiphenyl (BZ 8)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9256	2,4'-Dichlorobiphenyl (BZ 8)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9258	2,5-Dichlorobiphenyl (BZ 9)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9258	2,5-Dichlorobiphenyl (BZ 9)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9259	2,6-Dichlorophenyl (BZ 10)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9259	2,6-Dichlorophenyl (BZ 10)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8915	2-Chlorobiphenyl (BZ 1)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8915	2-Chlorobiphenyl (BZ 1)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9340	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9340	2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
9338	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9338	2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6385	2-Methylnaphthalene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6385	2-Methylnaphthalene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9060	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ 169)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9015	3,3',4,4',5-Pentachlorobiphenyl (BZ 126)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8965	3,3',4,4'-Tetrachlorobiphenyl (BZ 77)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9260	3,3',4,5,5'-Pentachlorobiphenyl (BZ 127)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9262	3,3',4,5-Tetrachlorobiphenyl (BZ 78)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9261	3,3',4,5'-Tetrachlorobiphenyl (BZ 79)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9263	3,3',4-Trichlorobihenyl (BZ 35)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019

Laboratory Scope of Accreditation

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9263	3,3',4-Trichlorobihenyl (BZ 35)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9264	3,3',5,5'-Tetrachlorobiphenyl (BZ 80)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9265	3,3',5-Trichlorobihenyl (BZ 36)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9265	3,3',5-Trichlorobihenyl (BZ 36)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8925	3,3'-Dichlorobiphenyl (BZ 11)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8925	3,3'-Dichlorobiphenyl (BZ 11)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8970	3,4,4',5-Tetrachlorobiphenyl (BZ 81)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9266	3,4,4'-Trichlorobiphenyl (BZ 37)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9267	3,4,5-Trichlorobihenyl (BZ 38)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9267	3,4,5-Trichlorobihenyl (BZ 38)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9268	3,4',5-Trichlorobihenyl (BZ 39)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9268	3,4',5-Trichlorobihenyl (BZ 39)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9270	3,4-Dichlorobiphenyl (BZ 12)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9270	3,4-Dichlorobiphenyl (BZ 12)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9269	3,4'-Dichlorobiphenyl (BZ 13)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9269	3,4'-Dichlorobiphenyl (BZ 13)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9271	3,5-Dichlorobiphenyl (BZ 14)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

**E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2**

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9271	3,5-Dichlorobiphenyl (BZ 14)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9272	3-Chlorobiphenyl (BZ 2)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9272	3-Chlorobiphenyl (BZ 2)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
9353	4,4,5,5,6,6,6-Heptafluorohexanoic Acid (3:3 FTCA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9353	4,4,5,5,6,6,6-Heptafluorohexanoic Acid (3:3 FTCA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
7355	4,4'-DDD	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7355	4,4'-DDD	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7355	4,4'-DDD	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7360	4,4'-DDE	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7360	4,4'-DDE	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7360	4,4'-DDE	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7365	4,4'-DDT	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7365	4,4'-DDT	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7365	4,4'-DDT	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9273	4,4'-Dichlorobiphenyl (BZ 15)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6951	4,8-Dioxa-3H-perfluorononanoic Acid (ADONA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9274	4-Chlorobiphenyl (BZ 3)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9274	4-Chlorobiphenyl (BZ 3)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6952	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid (9-ClPF3ONS)	EPA 1633	10123463	Extractable Organics	1/31/2024
5500	Acenaphthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5500	Acenaphthene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
5505	Acenaphthylene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5505	Acenaphthylene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
7025	Aldrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7025	Aldrin	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7025	Aldrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7240	alpha-Chlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7240	alpha-Chlordane	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7240	alpha-Chlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
5555	Anthracene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5555	Anthracene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
5575	Benzo(a)anthracene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5575	Benzo(a)anthracene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
5580	Benzo(a)pyrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5580	Benzo(a)pyrene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
5585	Benzo(b)fluoranthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5585	Benzo(b)fluoranthene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
5590	Benzo(g,h,i)perylene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5590	Benzo(g,h,i)perylene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
5600	Benzo(k)fluoranthene	EPA 8270E	10242543	Extractable Organics	3/31/2023

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
5600	Benzo(k)fluoranthene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
7115	beta-BHC (beta-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7115	beta-BHC (beta-Hexachlorocyclohexane)	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7115	beta-BHC (beta-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
5855	Chrysene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5855	Chrysene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
7925	cis-Nonachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7925	cis-Nonachlor	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Extractable Organics	10/16/2019
7925	cis-Nonachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
9105	Decachlorobiphenyl (BZ 209)	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9105	Decachlorobiphenyl (BZ 209)	SGS AXYS MLA-908 / GC-MS / EPA 1628	60039158	Pesticides-Herbicides-PCB's	12/9/2021
7105	delta-BHC	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7105	delta-BHC	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7105	delta-BHC	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
5895	Dibenz(a,h)anthracene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5895	Dibenz(a,h)anthracene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
7470	Dieldrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7470	Dieldrin	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7470	Dieldrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
9387	Dioxin	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
7510	Endosulfan I	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7510	Endosulfan I	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7510	Endosulfan I	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7515	Endosulfan II	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7515	Endosulfan II	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019

Attachment to Certificate #: E871007-44, expiration date June 30, 2025. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7515	Endosulfan II	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7520	Endosulfan sulfate	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7520	Endosulfan sulfate	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7520	Endosulfan sulfate	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7540	Endrin	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7540	Endrin	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7540	Endrin	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7530	Endrin aldehyde	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7530	Endrin aldehyde	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7530	Endrin aldehyde	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7535	Endrin ketone	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7535	Endrin ketone	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7535	Endrin ketone	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
6265	Fluoranthene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6265	Fluoranthene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
6270	Fluorene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6270	Fluorene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7245	gamma-Chlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7245	gamma-Chlordane	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7245	gamma-Chlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7685	Heptachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7685	Heptachlor	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7685	Heptachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7690	Heptachlor epoxide	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7690	Heptachlor epoxide	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7690	Heptachlor epoxide	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
6275	Hexachlorobenzene	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
6275	Hexachlorobenzene	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
6275	Hexachlorobenzene	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9460	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	EPA 1633	10123463	Extractable Organics	1/31/2024
9438	Hpcdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9438	Hpcdd, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9438	Hpcdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9438	Hpcdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9438	Hpcdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9444	Hpcdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9444	Hpcdf, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9444	Hpcdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9444	Hpcdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9444	Hpcdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9468	Hxcdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9468	Hxcdd, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9468	Hxcdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9468	Hxcdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9468	Hxcdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9483	Hxcdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9483	Hxcdf, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9483	Hxcdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9483	Hxcdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9483	Hxcdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
6315	Indeno(1,2,3-cd)pyrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6315	Indeno(1,2,3-cd)pyrene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019

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E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
7810	Methoxychlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7810	Methoxychlor	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7810	Methoxychlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
7870	Mirex	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7870	Mirex	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7870	Mirex	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
5005	Naphthalene	EPA 8270E	10242543	Extractable Organics	3/31/2023
5005	Naphthalene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
9395	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9395	N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
4846	N-Ethylperfluorooctane sulfonamido acetic acid (NEtFOSAA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9431	N-ethylperfluorooctane sulfonamido ethanol (EtFOSE)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9431	N-ethylperfluorooctane sulfonamido ethanol (EtFOSE)	EPA 1633	10123463	Extractable Organics	1/31/2024
9433	N-Methylperfluorooctane sulfonamide (MeFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9433	N-Methylperfluorooctane sulfonamide (MeFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
4847	N-Methylperfluorooctane sulfonamido acetic acid (NMeFOSAA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6949	N-Methylperfluorooctane sulfonamido ethanol (MeFOSE)	EPA 1633	10123463	Extractable Organics	1/31/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6956	Nonafluoro-3,6-dioxaheptanoic Acid (NFDHA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
3890	Oxychlordane	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
3890	Oxychlordane	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Extractable Organics	10/16/2019
3890	Oxychlordane	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019
8875	PCBs, as congeners	EPA 1668	10129201	Pesticides-Herbicides-PCB's	12/18/2019

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State Laboratory ID: E871007 **EPA Lab Code: CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
8875	PCBs, as congeners	SGS AXYS MLA-010 / GC-HRMS	60039012	Pesticides-Herbicides-PCB's	12/18/2019
8875	PCBs, as congeners	SGS AXYS MLA-210 / GC-MS-MS	60039090	Pesticides-Herbicides-PCB's	12/18/2019
8875	PCBs, as congeners	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
9555	Pecdd, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9555	Pecdd, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9555	Pecdd, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9555	Pecdd, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9555	Pecdd, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9552	Pecdf, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9552	Pecdf, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9552	Pecdf, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9552	Pecdf, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9552	Pecdf, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6957	Perfluoro(2-ethoxyethane) Sulfonic Acid (PFEESA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6965	Perfluoro-3-methoxypropanoic Acid (PFMPA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6966	Perfluoro-4-methoxybutanoic Acid (PFMBA)	SGS AXYS MLA-110 / LC-MS-MS	60039078	Extractable Organics	8/31/2021
6911	Perfluorobutane Sulfonate (PFBS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6918	Perfluorobutane Sulfonic Acid (PFBS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6919	Perfluorobutanoate (PFBA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6915	Perfluorobutanoic Acid (PFBA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9562	Perfluorodecane sulfonate (PFDS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6920	Perfluorodecane Sulfonic Acid (PFDS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6921	Perfluorodecanoate (PFDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6905	Perfluorodecanoic Acid (PFDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6922	Perfluorododecane Sulfonate (PFDoS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021

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State Laboratory ID: **E871007** **EPA Lab Code:** **CN00003** **(250) 655-5800**

E871007
SGS AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: **Biological Tissue**

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
6923	Perfluorododecane Sulfonic Acid (PFDoS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6924	Perfluorododecanoate (PFDoA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6903	Perfluorododecanoic Acid (PFDoA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6925	Perfluoroheptane Sulfonate (PFHpS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9470	Perfluoroheptane Sulfonic Acid (PFHpS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6926	Perfluoroheptanoate (PFHpA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6908	Perfluoroheptanoic Acid (PFHpA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6927	Perfluorohexane Sulfonic Acid (PFHxS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6927	Perfluorohexane Sulfonic Acid (PFHxS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6928	Perfluorohexanoate (PFHxA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6913	Perfluorohexanoic Acid (PFHxA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9464	Perfluorononane Sulfonate (PFNS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6929	Perfluorononane Sulfonic Acid (PFNS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6930	Perfluorononanoate (PFNA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6906	Perfluorononanoic Acid (PFNA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6917	Perfluorooctane sulfonamide (PFOSA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6917	Perfluorooctane sulfonamide (PFOSA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6909	Perfluoro-octane Sulfonate (PFOS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6931	Perfluorooctane sulfonic acid (PFOS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6932	Perfluoro-octanoate (PFOA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6912	Perfluorooctanoic Acid (PFOA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6933	Perfluoropentane Sulfonate (PFPeS)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6934	Perfluoropentane Sulfonic Acid (PFPeS)	EPA 1633	10123463	Extractable Organics	1/31/2024
6935	Perfluoropentanoate (PFPeA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6914	Perfluoropentanoic Acid (PFPeA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6902	Perfluorotetradecanoic acid (PFTDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
6902	Perfluorotetradecanoic acid (PFTDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
9563	Perfluorotridecanoic acid (PFTrDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021
9563	Perfluorotridecanoic acid (PFTrDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6944	Perfluoroundecanoate (PFUnDA)	AXYS SOP MLA-110 / LC-MS-MS (Rev. 2)	60001992	Extractable Organics	1/21/2021

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2045 Mills Road West
Sidney, BC V8L 5X2

Matrix: Biological Tissue

Analyte#	Analyte	Method/Tech	Method Code	Category	Effective Date
6904	Perfluoroundecanoic acid (PFUnDA)	EPA 1633	10123463	Extractable Organics	1/31/2024
6615	Phenanthrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6615	Phenanthrene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
6665	Pyrene	EPA 8270E	10242543	Extractable Organics	3/31/2023
6665	Pyrene	SGS AXYS MLA-021 / GC-MS	60039034	Extractable Organics	10/16/2019
9609	TCDD, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9609	TCDD, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9609	TCDD, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9609	TCDD, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9609	TCDD, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
9615	TCDF, total	AXYS SOP MLA-017 / GC-HRMS	60001925	Extractable Organics	1/1/2007
9615	TCDF, total	EPA 1613	10120408	Extractable Organics	10/16/2019
9615	TCDF, total	EPA 8290A	10187403	Pesticides-Herbicides-PCB's	3/31/2023
9615	TCDF, total	SGS AXYS Method ATM 16130	60038304	Extractable Organics	12/9/2021
9615	TCDF, total	SGS AXYS MLA-217 / GC-MS-MS	60039114	Extractable Organics	10/16/2019
8876	Total Dichlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8877	Total Heptachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8888	Total Hexachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8889	Total Monochlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8891	Total Nonachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8892	Total Octachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8896	Total pentachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8893	Total Tetrachlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
8894	Total Trichlorobiphenyls	SGS AXYS MLA-908 / GC-MS	60033810	Pesticides-Herbicides-PCB's	12/18/2019
7910	trans-Nonachlor	EPA 1699	10133105	Pesticides-Herbicides-PCB's	12/18/2019
7910	trans-Nonachlor	SGS AXYS MLA-028 / HRGC-HRMS	60039056	Pesticides-Herbicides-PCB's	12/18/2019
7910	trans-Nonachlor	SGS AXYS MLA-228 / GC-MS-MS	60039147	Pesticides-Herbicides-PCB's	12/18/2019

Revision Log

Revision: 2.6	**Effective date:**	This version
Section	**Justification**	**Changes**
Title	Added reference to 1633A	Added reference to 1633A
1.3	Added	1633A reference added as Section 1.3
6.21 - 6.24	Addition	Added Sections 6.21 - 6.24. Subsequent sections renumbered.
8.0	Addition/clarification	Footnote 3 added for soils and tissues.
11	Formatting adjustments	Subsection in section 11 were adjusted accordingly with the addition of PromoChrom process.
11.2	Addition	Note added about client approval for dilution/sub-sampling unless noted otherwise in project notes.
11.9	Updating SOP to include PromoChrom Process	Added PromoChrom process. Subsequent sections renumbered.
13.3.2	Addition/clarification	Added clarification as to IDA criteria for IDOC
Throughout	Updated SOP to D4 SOP numbers	Updated SOP to D4 SOP numbers
Throughout	Editorial changes	Editorial changes

Revision: 2.5	**Effective date:**	11 NOV 2024
Section	**Justification**	**Changes**
7.1.20	Added '(Referred to reagent water in the SOP)."	

Revision: 2.5	Effective date:	11 NOV 2024
Section	**Justification**	**Changes**
11.4.1.1	Addition	Added for clarity
12.4.4	Addition	Added "PFOA"
Throughout	Editorial Changes	Editorial Changes

Revision: 2.4	Effective date:	21 OCT 2024
Section	**Justification**	**Changes**
Method description	Addition	"(Final)" was added to the method description on the title page for clarification
6.8.1	Addition	Added "This specific cartridge has a pKa conjugate above 8."
6.9 and 6.10	Removal	Sections 6.9 and 6.10 were deleted as they were no longer in use. Subsequent renumbering.
6.10.1	Addition	Added
6.11	Change	Removed 'JT Baker Baker-pHIX pH 1.0-9.0' and added 'VWR Chemicals pH Test 0-14'.
7.1.16	Addition	"of 65%" added
7.2.1	Revision	Revised to "The 40 PFAS analytes specified in Method 1633 are purchased as high purity solids (98% or greater)..." and "See WS-QA-0017 for more details."
7.2.5	Addition	Added "See WS-QA-0017 for details about solutions being in basic to perfect esterification."
7.7.1, 7.7.1.1	Revision	Sections 7.7.1, 7.7.1.1, and Table 7.7.1.1 revised.
7.7.4	Revision	"Commercial PFAS Mix" revised to "ICV MIX"
8.5.1	Addition	Added 'Note in the benchsheet whether the sample passed the visual TSS evaluation or not."
9.3.2.1	Addition	Added 'or LOQ'
9.11.3	Revision	"If the IDa is not part of 1633..." revised to "If the IDA is not listed in the reference method..."
11.5.3	Revision	Removed "2g for tissue" and added "...or a 2g wet weight for tissue."
11.3.5.1	Addition	Added "7. Should the SPE column plug, file an NCM stating such."
11.5.11	Addition	Added "The temperature of this water bath will be kept at an embient room temperature in a range of 16 - 25 degrees Celcius"
Tables 11.9-2 and 11.9-3	Removal	Removed rows for TDCA_2, TDCA_3, and TDCA_4.
Table 11.9-2	Revision	TCDCA Q1 revosed tp "498.29" and Q3 revised to "123.90" and TUDCA Q1 revised to "499.29" and Q3 revised to "123.90".
Table 11.9-3	Revision	Updated to current parameters: M2-4:2FTS to 13Cs-4:2FTS M2-4:2FTS_2 to 13C2-4:2FTS_2 M2-6:2FTS to 13C2-6:2FTS M2-6:2FTS to 13C2-2:2FTS_2 M2-8:2FTS to 13C2-8:2FTS M2-8:2FTS_2 to 13C2-8:2FTS_2
12.1.2	Addition	"The IDA recoveries in the diluted extract are to meet acceptance limits stored in TALS and have S/N >= 20:1"
Throughout	Editorial Changes	Editorial Changes

Reference

1.1. Method 1633 – Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids and Tissue Samples by LC-MS/MS, January 2024.

1.2. Department of Defense and Department of Energy Quality Systems Manual for Environmental Laboratories, Version 6.0, December 2023.

1.3. Method 1633, Revision A - Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS, December 2024

Cross Reference

Document	Document Title
SAC-T-OP-SOP70329	Cleaning of Glassware (Organics)
NDSC-US EHS-QP46060	Environmental Health and Safety (EHS) Manual
SAC-QA-SOP71665	Standards and Reagents and Quality Control Check Procedures
SAC-QA-P-QP71748	Quality Control Program
NDSC-QA-QP44940	Calibration Curves and Selection of Calibration Points
QA-SOP70881	Nonconformance and Corrective Action System
SAC-QA-P-QP71754	Data Review Policy
QA-SOP71736	Detection and Quantitation Limits

1) Scope and Application

1.1. This procedure describes the analysis of water, soil, solids, biosolids, and tissue samples for the following compounds using liquid chromatography / tandem mass spectrometry (LC/MS/MS).

Table 1.1 PFAS Supported		
Compound Name	**Abbreviations**	**CAS #**
Short Chain		
Perfluoropropionic acid *	PFPrA, PPF Acid	422-64-0
Bis(trifluoromethane)sulfonamide *	TFSI	82113-65-3
Perfluoroalkylcarboxylic acids (PFCAs)		
Perfluoro-n-butanoic acid	PFBA	375-22-4
Perfluoro-n-pentanoic acid	PFPeA	2706-90-3
Perfluoro-n-hexanoic acid	PFHxA	307-24-4
Perfluoro-n-heptanoic acid	PFHpA	375-85-9
Perfluoro-n-octanoic acid	PFOA	335-67-1
Perfluoro-n-nonanoic acid	PFNA	375-95-1
Perfluoro-n-decanoic acid	PFDA	335-76-2
Perfluoro-n-undecanoic acid	PFUnA	2058-94-8
Perfluoro-n-dodecanoic acid	PFDoA	307-55-1
Perfluoro-n-tridecanoic acid	PFTrDA	72629-94-8
Perfluoro-n-tetradecanoic acid	PFTeDA	376-06-7
Perfluoro-n-hexadecanoic acid *	PFHxDA	67905-19-5
Perfluoro-n-octadecanoic acid *	PFODA	16517-11-6
Perfluorinated sulfonic acids (PFSAs)		
Perfluoro-1-butanesulfonic acid	PFBS	375-73-5
Perfluoro-1-pentanesulfonic acid	PFPeS	2706-91-4
Perfluoro-1-hexanesulfonic acid	PFHxS	355-46-4
Perfluoro-1-heptanesulfonic acid	PFHpS	375-92-8
Perfluoro-1-octanesulfonic acid	PFOS	1763-23-1
Perfluoro-nonanesulfonic acid	PFNS	68259-12-1
Perfluoro-1-decanesulfonic acid	PFDS	335-77-3
Perfluoro-1-dodecansulfonic acid	PFDoS	79780-39-5
Perfluorinated sulfonamides (FOSAs)		
Perfluoro-1-octanesulfonamide	PFOSA, (FOSA)	754-91-6
N-ethylperfluoro-1-octanesulfonamide	NEtFOSA (Et-FOSA)	4151-50-2
N-methylperfluoro-1-octanesulfonamide	NMeFOSA (Me-FOSA)	31506-32-8
Perfluorinated sulfonamide ethanols (FOSEs)		
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	NEtFOSE (Et-FOSE)	1691-99-2
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	NMeFOSE (Me-FOSE)	24448-09-7
Perfluorinated sulfonamidoacetic acids (FOSAAs)		
N-ethylperfluoro-1-octanesulfonamidoacetic acid	NEtFOSAA (EtFOSAA)	2991-50-6
N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA (MeFOSAA)	2355-31-9

Table 1.1 PFAS Supported		
Compound Name	**Abbreviations**	**CAS #**
Short Chain		
Perfluoropropionic acid *	PFPrA, PPF Acid	422-64-0
Bis(trifluoromethane)sulfonamide *	TFSI	82113-65-3
Fluorotelomer sulfonic acids (FTS)		
1H,1H,2H,2H-perfluorohexane sulfonic acid *(4:2)*	4:2 FTS	757124-72-4
1H,1H,2H,2H-perfluorooctane sulfonic acid *(6:2)*	6:2 FTS	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonic acid *(8:2)*	8:2 FTS	39108-34-4
Fluorotelomer carboxylic acids (FTCAs)		
3-Perfluoropropylpropanoic acid	3:3 FTCA	356-02-5
3-Perfluoropentylpropanoic acid	5:3 FTCA	914637-49-3
3-Perfluoroheptylpropanoic acid	7:3 FTCA	812-70-4
Per-and Polyfluoroether carboxylic acids		
Perfluoro(2-propoxypropanoic) acid or Hexafluoropropylene oxide dimer acid	HFPO-DA, GenX	13252-13-6
4,8-dioxa-3H-perfluorononanoic acid	ADONA(1) (DONA)	919005-14-4
Perfluoro-3-methoxypropanoic acid (PFMPA)	PFMPA, (PFECA F)	377-73-1
Perfluoro-4-methoxybutanoic acid (PFMBA)	PFMBA,(PFECA A)	863090-89-5
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NFDHA (PFECA B)	151772-58-6
Ether sulfonic acids		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA (PES)	113507-82-7

Note: *Abbreviations in parenthesis are the abbreviations used by the laboratory's LIMS where they differ from the abbreviation listed in Method 1633.*
**Analyte not officially listed in Method 1633, but added to meet market demands.*
(1) In some literature, the acronym ADONA refers to the ammonium salt, CAS 958445-44-8, and DONA refers to the parent acid. In Method 1633, ADONA refers to the parent acid. DONA is the acronym present on the laboratory raw data.

1.2. The working range of the method is listed below. The linear range can be extended by diluting the extracts. Note that all compounds are reported in their acid form. Reporting limits and Method Detection Limits for individual compounds are stored in the laboratory's LIMS.

Table 1.2 Reporting Limits and Working Range			
Matrix	**Nominal Sample Size**	**Reporting Limit**	**Working Range**
Water	125 mL	1.5 ng/L – 10 ng/L	1.5 ng/L – 2,000 ng/L
Leachate	25 mL	7.5 ng/L – 50 ng/L	7.5 ng/L – 10,000 ng/L
Solid	2 g	0.2 ng/g – 1.0 ng/g	0.2 ng/g - 125 ng/g
Biosolids	0.5 g	0.8 ng/g – 4.0 ng/g	2 ng/g – 500 ng/g
Tissue	2 g	0.4 ng/g – 2.0 ng/g	0.4 ng/g – 250 ng/g

2) Summary of Method

2.1. Water samples are extracted using a solid phase extraction (SPE) cartridge. PFAS are eluted from the cartridge with an ammonium hydroxide (NH4OH)/methanol solution.

2.2. Solid/biosolids samples are extracted with a NH4OH/methanol solution using agitation for 1 hour. The extract is then cleaned using a solid phase extraction (SPE) cartridge. PFAS are eluted from the cartridge with an ammonium hydroxide (NH4OH)/methanol solution.

2.3. Tissue samples are extracted with a potassium hydroxide (KOH)/methanol and acetonitrile solutions using agitation for 16 hours and sonication for 30 minutes. The extract is then cleaned using a solid phase extraction (SPE) cartridge. PFAS are eluted from the cartridge with an ammonium hydroxide (NH4OH)/methanol solution.

2.4. The final extracts are analyzed by LC/MS/MS. PFAS are separated from other components on a C18 column with a solvent gradient program using 5 mM ammonium acetate/water and methanol. The mass spectrometer detector is operated in the electrospray (ESI) negative ion mode for the analysis of PFAS.

2.5. An isotope dilution technique is employed with this method for the compounds of interest. The isotope dilution analytes (IDA) consist of carbon-13 labeled analogs or deuterated analogs of the compounds of interest, and they are fortified into the samples at the time of extraction. This technique allows for the correction for analytical bias encountered when analyzing more chemically complex environmental samples. The isotopically labeled compounds are chemically similar to the compounds of concern and are therefore affected by sample-related interferences to the same extent as the compounds of concern. Compounds that do not have an identically labeled analog are quantitated by the IDA method using a closely related labeled analog.

2.6. Quantitation by the internal standard method is employed for the IDA analytes/recoveries. Peak response is measured as the area of the peak.

3) Definitions

3.1. PFAS: Per- and Polyfluoroalkyl Substances

3.2. PFCAs: Perfluorocarboxylic acids

3.3. PFSAs: Perfluorinated sulfonic acids

3.4. FOSA: Perfluorinated sulfonamide

3.5. PFOA: Perfluorooctanoic acid

3.6. PFOS: Perfluorooctane sulfonic acid

3.7. PTFE: Polytetrafluoroethylene (e.g. Teflon®)

3.8. SPE: Solid phase extraction

3.9. PP: Polypropylene

3.10. PE: Polyethylene

3.11. HDPE: High density polyethylene

3.12. AFFF: Aqueous Film Forming Foam

3.13. TDCA: Taurodeoxycholic acid

3.14. TCDA: Taurochenodeoxycholic acid

3.15. TUDCA: Tauroursodeoxycholic acid

3.16. IDA: Isotope dilution analyte (equivalent to EIS in reference method)

3.17. IS: Internal Standard (equivalent to NIS in reference method)

3.18. LCS: Laboratory control sample (equivalent to OPR in reference method)

3.19. Further definitions of terms used in this SOP may be found in the glossary of the Laboratory Quality Assurance Manual (QAM).

4) Interferences

4.1. PFAS have been used in a wide variety of manufacturing processes, and laboratory supplies should be considered potentially contaminated until they have been tested and shown to be otherwise. The materials and supplies used during the method validation process have been tested and shown to be clean (i.e., no contribution greater than the method detection limit (MDL)). These items are listed below in Section 6.

4.2. To avoid contamination of samples, standards are prepared in a ventilation hood in an area separate from where samples are extracted.

4.3. PTFE products can be a source of PFOA contamination. The use of PTFE in the procedure should be avoided or at least thoroughly tested before use. Polypropylene (PP) or polyethylene (PE, HDPE) products may be used in place of PTFE products to minimize PFOA contamination.

4.3.1. Standards and samples are injected from polypropylene autosampler vials with polypropylene screw caps once. Multiple injections may be performed on Primers when conditioning the instrument for analysis.

4.3.2. Random evaporation losses have been observed with the polypropylene caps causing high IDA recovery after the vial was punctured and sample re-injected. For this reason, it is best to inject standards and samples once in the analytical sequence.

4.3.3. Teflon-lined screw caps have detected PFAS at low concentrations. Repeated injection from the same Teflon-lined screw cap have detected PFNA at increasing concentration as each repeated injection was performed, therefore, it is best to use polypropylene screw caps.

4.4. Volumetric glassware and syringes are difficult to clean after being used for solutions containing high levels of PFOA. These items should be labeled for use only with similarly concentrated solutions or verified clean prior to re-use. To the extent possible, disposable labware is used.

4.5. Both branched and linear PFAS isomers can potentially be found in the environment. Linear and branched isomers are known to exist for PFOS, PFOA, PFNA, PFHxS, FOSA, PFBS, Et-FOSA, Me-FOSA, Et-FOSE, Me-FOSE, Et-FOSAA, and Me-FOSAA based upon the scientific literature. If multiple isomers are present for one of these PFAS they might be adjacent peaks that completely resolve or not, but usually with a deflection point resolved during peak integration. The later of these peaks matches the retention time of its labeled linear analog. In general, earlier peaks are the branched isomers and are not the result of peak splitting.

As of this writing, only PFOS, PFOA, PFNA, PFHxS, FOSA, Et-FOSA, Me-FOSA, Et-FOSE, Me-FOSE, Et-FOSAA and Me-FOSAA are commercially available as technical mixtures. These reference standards of the technical mixtures for these specific PFAS are used to ensure that all appropriate peaks are included during peak integration.

4.6. In an attempt to reduce PFOS bias, it is required that m/z 499>80 transition be used as the quantitation transition.

4.7. Aluminum foil should not be used for this analysis due to the potential interferences from the PFAS used as release agents.

5) Safety

Employees must abide by the policies and procedures in the NBLSC Health, Safety and Environment Manual (*NDSC-US EHS-QP46060*), Sacramento Supplement to the HSEM, and this document. All work must be stopped in the event of a known or potential compromise to the health or safety of an associate. The situation must be reported **immediately** to a supervisor, the EH&S Staff, or a senior manager.

5.1. Specific Safety Concerns

5.1.1. Preliminary toxicity studies indicate that PFAS could have significant toxic effects. In the interest of keeping exposure levels as low as reasonably achievable, PFAS and PFAS samples must be handled in the laboratory as hazardous and toxic chemicals.

5.1.2. The use of a filtering syringe with the SPE cartridge, if and when needed, presents an extreme risk of ergonomic injury due to the force needed to push the sample through the cartridge, and the set-up and body geometry of the individual using the syringe/SPE cartridge. Use step boxes to position yourself above the syringe and manifold so that your body weight can be carefully applied to pushing the syringe plunger down, rather than just using your arm and shoulder muscles. Ensure that this task is rotated amongst staff members so that no one has to do it repeatedly for weeks or months. Ensure that routine breaks are taken, and that muscles and joints involved with this task are routinely stretched to offset this hazard.

5.1.3. Exercise caution when using syringes with attached filter disc assemblies. Application of excessive force has, upon occasion, caused a filter disc to burst during the process.

5.1.4. Laboratory procedures such as manual use of Vortex mixers or similar equipment, hand shaking samples beyond several inversions, repetitive use of pipets, repetitive transferring of extracts and manipulation of filled separatory funnels and other glassware represent a significant potential for repetitive motion or other ergonomic injuries. Laboratory associates performing these procedures are in the best position to realize when they are at risk for these types of injuries. Whenever a situation is found in which an employee is performing the same repetitive motion, the employee shall immediately bring this to the attention of their supervisor, manager, or the EH&S staff. The task will be analyzed to determine a better means of accomplishing it. This specifically includes identification and use of mechanical options that reduce the amount of manual handling required to perform extraction procedures such as Vortex mixing and shaking.

5.1.5. Eye protection that satisfies ANSI Z87.1 (as per the NBLSC Safety Manual), laboratory coat, and nitrile gloves must be worn while handling samples, standards, solvents, and reagents. Disposable gloves that have been contaminated will be removed and discarded; other gloves will be cleaned immediately.

5.1.6. Perfluorocarboxylic acids are acids and are not compatible with strong bases.

5.1.7. The use of vacuum systems presents the risk of imploding glassware. All glassware used during vacuum operations must be thoroughly inspected prior to each use. Glass that is chipped, scratched, cracked, rubbed, or marred in any manner must not be used under vacuum. It must be removed from service and replaced.

5.2. Primary Materials Used

The following is a list of the materials used in this method, which have a serious or significant hazard rating. **NOTE: This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table.** A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Material(1)	Hazards	Exposure Limit(2)	Signs and Symptoms of Exposure
Acetic Acid (3-2-1)	Corrosive Poison Flammable	10 ppm-TWA 15 ppm-STEL	Contact with concentrated solution may cause serious damage to the skin and eyes. Inhalation of concentrated vapors may cause serious damage to the lining of the nose, throat, and lungs. Breathing difficulties may occur.
Acetonitrile (2-3-0)	Flammable Poison	20 ppm-TWA	Early symptoms may include nose and throat irritation, flushing of the face, and chest tightness. Prolonged exposure to high levels of vapors may cause formation of cyanide anions in the body.
Ammonium Hydroxide (3-1-0)	Corrosive Poison	50 ppm-TWA	Severe irritant. Effects from inhalation of dust or mist vary from mild irritation to serious damage to the upper respiratory tract. Symptoms may include sneezing, sore throat or runny nose. Contact with skin can cause irritation or severe burns and scarring with greater exposures. Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent damage, including blindness. Brief exposure to 5000 PPM can be fatal.
Formic Acid (3-2-1)	Flammable Corrosive Toxic Irritant	5 ppm TWA 10 ppm STEL	Extremely destructive on contact with skin, mucous membranes, eyes, upper respiratory tract. Inhalation may result in spasms, inflammation and edema. Symptoms include burning sensation, coughing, wheezing, shortness of breath, headache, nausea, vomiting, and depression.

Material(1)	Hazards	Exposure Limit(2)	Signs and Symptoms of Exposure
Methanol (2-3-0)	Flammable Poison Irritant	200 ppm PEL 250 ppm STEL	Harmful or fatal if swallowed, or absorbed through the skin. Causes eye, skin and respiratory tract irritation, and may cause central nervous system depression. A slight irritant to the mucous membranes. Toxic effects exerted upon nervous system, particularly the optic nerve. Symptoms of overexposure may include headache, drowsiness and dizziness. Methyl alcohol is a defatting agent and may cause skin to become dry and cracked. Skin absorption can occur; symptoms may parallel inhalation exposure. Irritant to the eyes.
Potassium Hydroxide (3-0-1)	Corrosive Poison	2 mg/m^3 (Ceiling)	Symptoms of inhalation may include coughing, sneezing, and damage to the nasal or respiratory tract. High concentrations can cause lung damage. Contact with skin can cause irritation or severe burns and scarring with greater exposures. Causes irritation of eyes with tearing, redness, and swelling.
Sodium Hydroxide (3-0-1)	Corrosive Poison	2 Mg/M3-PEL	Severe irritant. Effects from inhalation of dust or mist vary from mild irritation to serious damage of the upper respiratory tract, depending on severity of exposure. Symptoms may include sneezing, sore throat or runny nose. Contact with skin can cause irritation or severe burns and scarring with greater exposures. Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness.
(1) Always add acid to water to prevent violent reactions. (2) Exposure limit refers to the OSHA regulatory exposure limit.			

6) Equipment and Supplies

Due to the ubiquitous nature of PFAS, all disposable equipment (including, but not limited to vials, pipet tips, and SPE manifold parts) that directly contacts a sample or extract is subject to QC checks on a by-lot basis prior to use. At a minimum, the QC checks include either a rinse with DI water or an extraction with basic methanol to mimic the usage encountered during sample preparation. QC check data is kept on file for reference as needed. Processes for cleaning extraction manifolds and associated components are described in *SAC-T-OP-SOP70329*, "Glassware Cleaning". All equipment described below must be constructed of materials that will not react with or sorb PFAS constituents and before use must be demonstrated to be free of PFAS at levels that would be detectable (i.e., at or above the laboratory's MDLs) in blanks or samples.

6.1. 15 mL polypropylene test tubes with polypropylene screw caps.

6.2. 50 mL graduated plastic centrifuge tubes.

6.3. 125 mL HDPE bottles with HDPE screw caps. The average weight of the HDPE bottles with HDPE screw caps are calibrated once per year. The calibration is performed by weighing 10 bottles with caps and dividing by 10 to get the average weight. The average weight is used in Section 11.3.5.1 Step 4.

6.4. Analytical balance capable of accurately weighing to the nearest 0.0001g, and checked for accuracy each day it is used in accordance with *SAC-T-OP-SOP70329*.

6.5. Extract concentrator or nitrogen manifold with water bath heating to 65°C.

6.6. Syringe filter, PALL/Acrodisc 0.2 um Nylon membrane, 25 mm, or equivalent. Do not use PTFE type filters.

6.7. 300 µL autosampler vials, polypropylene, with polypropylene screw caps, Waters PN 1860004112, or equivalent.

6.8. SPE columns

6.8.1. Phenomenex 200mg Wax / 10mg GCB (Part# CS0-9218) or equivalent. This specific cartridge should have a pKA conjugate above 8.

6.9. Vacuum manifold for Solid Phase Extraction (SPE) Supelco Visiprep, or equivalent. A manual vacuum manifold with column adapters, disposable liners, and column reservoirs for cartridge extraction.

6.10. Miscellaneous laboratory apparatus (beakers, test tubes, volumetric flasks, pipettes, etc.). These should be disposable where possible, or marked and segregated for high-level versus low-level use.

6.10.1. Manifold liners must be rinsed using the following steps:

6.10.1.1. Take approximately 75 liners and place them into a 10 oz. poly snap cap.

6.10.1.2. Pour MeOH until all the liners are submerged.

6.10.1.3. Pour out 30 – 40 mL of MeOH from the poly snap cap, close the cap, and shake 3 times.

6.10.1.4. Pour out all of the MeOH from the snap cap into a waste container.

6.10.1.5. Rinse the liner with nano pure water. (This can be done by the handful).

6.10.1.6. Place clean liners into a new 10 oz. snap cap.

6.11. pH indicator paper, VWR Chemicals pH Test 0-14, or equivalent.

6.12. Centrifuge (Thermo Scientific Sorvall Legend X1, or equivalent), capable of reaching at least 4500 rpm.

6.13. Vortex Mixer (Scientific Industries model SI-0236 or equivalent).

6.14. Shaker table (Eberbach model 6010, or equivalent) for soil extractions.

6.15. Desiccator, part # B002VBW9XW or equivalent.

6.16. Drierite desiccant, part # 23005-UOM-EA or equivalent.

6.17. Oven, capable of maintaining a temperature of 104°C (+/- 1°C), Symphony part # 15-103-0503, or equivalent.

6.18. Pre-weighed 47 mm filters, Environmental Express part # F93447MM or equivalent.

6.19. Vacuum pump, CPS Products VP2D Pro-set 2 State, part # UX-07164-83 or equivalent.

6.20. Liquid Chromatography/Tandem Mass Spectrometer (LC/MS/MS) –The instrument described below, or equivalent, may be used for this method. The HPLC is equipped with a refrigerated autosampler, an injection valve, and a pump capable of variable flow rate. The use of a column heater is required to maintain a stable temperature throughout the analytical run. Data is processed using Chrom Peak Review, version 2.3 or equivalent. The MS/MS is capable of running in the NI-ESI mode at the recommended flow rate with a minimum of 10 scans per peak.

6.20.1. SCIEX LC/MS/MS
This system consists of a Shimadzu HPLC interfaced with a SCIEX 5500 Triple Quad MS, or equivalent. The instrument control and data acquisition software is SCIEX Analyst, version 1.6.3 or equivalent.

6.20.1.1. Shimadzu CTO-20AC HPLC equipped with 3 LC-20AD pumps and one DGU-20 degassing unit or equivalent.

6.20.1.2. Acquity Peptide BEH C18 2.1 x 50 mm, Part No. 186003554, or equivalent.

6.20.1.3. PFAS Isolator column, Phenomenex Luna C_{18} 5 µm, 30 x 3 mm, part no. 00A-4252-Y0 or equivalent. This is plumbed between the UPLC pumps and autosampler valve to minimize PFAS background from the UPLC solvent lines and filters.

6.21. Inline filter, Part #F-HC-30, PromoChrom Technologies or equivalent

6.22. Phenomenex Strata GCB, 25mg/1mL IC Cartridge, Part #8B-S528-CAJ or equivalent

6.23. Phenomenex Strata X-AW 33um polymeric weak anion-PFAS 200 mg/6mL tubes, Part #8B-S541-FCH or equivalent

6.24. Automated SPE unit – PromoChrom Technologies, PN SPE-03 or equivalent

6.25. Preventive and routine maintenance is described in the table below.

Table 6.23
HPLC/MS/MS Preventative Maintenance

As Needed:	**Daily (When in use)**
Change pump seals. Change in-line filters in autosampler (HPLC). Check/replace in-line frit if excessive pressure or poor performance. Replace column if no change following in-line frit change. Clean corona needle. Replace sample inlet tube in APCI (10.1 cm). Replace fused silica tube in ESI interface. Clean lenses. Clean skimmer. Ballast rough pump 30 minutes. Create all eluents in Reagent module, label eluent containers with TALS label and place 2nd label into maintenance log when put into use.	Check solvent reservoirs for sufficient level of solvent. Verify that pump is primed, operating pulse free. Check needle wash reservoir for sufficient solvent. Verify capillary heater temperature functioning. Verify vaporizer heater temperature. Verify rough pump oil levels. Verify turbo-pump functioning. Verify nitrogen pressure for auxiliary and sheath gasses. Verify that corona and multiplier are functioning.
Semi-Annually	**Annually**
Replace rough-pump oil (4-6 months). Replace oil mist and odor elements. Replace activated alumina filter if applicable	Vacuum system components including fans and fan covers. Clean/replace fan filters, if applicable.

7) Reagents and Standards

7.1. Reagent grade chemicals shall be used in all tests whenever available. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on the Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

7.1.1. Acetic acid, glacial.

7.1.2. Acetonitrile, HPLC Grade.

7.1.3. Ammonium acetate (solid salt).

7.1.4. Ammonium acetate (5 mM in water): Prepared by weighing 0.385 g of ammonium acetate and dissolving in 1 L of water. This solution has volatile components, thus it should be replaced every 7 days or sooner.

7.1.5. Ammonium hydroxide (NH_4OH), 30% in water, ACS reagent grade, Fisher product number A669S-500, or equivalent.

7.1.6. Ammonium hydroxide (NH_4OH), 3% in water: Prepared by diluting 10 mL of ammonium hydroxide (30%) with 90 mL of reagent water for a total volume of 100 mL. Replace after 3 months.

7.1.7. Ammonium hydroxide (NH_4OH), 0.3% in methanol (v/v): Prepared by diluting 10 mL of ammonium hydroxide (30%) into 990 mL of methanol for a total of 1 L.

7.1.8. Ammonium hydroxide (NH4OH), 1% in methanol (v/v): Prepared by diluting 33 mL of ammonium hydroxide into 967 mL of methanol for a total of 1 L.

7.1.9. Formic Acid, greater than 96% purity or equivalent, ACS reagent grade, Fisher product number A117, or equivalent.

7.1.10. Formic Acid, 0.1 M, in water: Prepared by dissolving 4.6 g of formic acid brought to 1 L in reagent water. Replace after 2 years.

7.1.11. Formic Acid, 0.3 M, in water: Prepared by dissolving 13.8 g (11.3 mL based on density) of formic acid brought to 1 L in reagent water. Replace after 2 years.

7.1.12. Formic Acid, 5% in water(v/v): Prepared by diluting 5 mL of formic acid with 95 mL of reagent water for a total volume of 100 mL. Replace after 2 years.

7.1.13. Formic Acid, 50% in water(v/v): Prepared by diluting 50 mL of formic acid with 50 mL of reagent water for a total volume of 100 mL. Replace after 2 years.

7.1.14. Methanol (MeOH).

7.1.15. Potassium Hydroxide (KOH) 85% assay (solid), Fisher Part number P250-1 or equivalent.

7.1.16. Potassium hydroxide, 0.4% in methanol (w/v): Prepared by weighing 18.8 g of 85% (16 g if >99% KOH) of potassium hydroxide and brought to 4 L in methanol.

7.1.17. Sodium hydroxide 1N, used for pH adjustments.

7.1.18. Ottawa Sand (blank matrix for solid samples).

7.1.19. Store bought chicken breast or tilapia (blank matrix for tissue samples).

7.1.20. Water, Nanopure or Millipore, must be free of interference and target analytes. (Referred to reagent water in the SOP).

7.1.21. Nitrogen, Ultra High Purity, used for the ESI interface, collision cell, and concentration of extracts.

7.1.22. Air, Ultra-Pure, used for vacuum and source gas.

7.1.23. 30:70 methanol:water (v/v), prepared by diluting 30 mL methanol with 70 mL HPLC reagent water or equivalent volume in respect to the ratio.

7.1.24. Instrument Blanks solution (95% MeOH, 5% H2O): Prepare by combining 19 mL of MeOH and1.0 mL reagent water.

7.2. Standards

7.2.1. The 40 PFAS analytes specified in Method 1633 are purchased as high purity solids (98% or greater) or as certified solutions. See *SAC-QA-SOP71665* for more details. Standard materials are verified when compared to a second source material at the time of initial calibration. The solid stock material is stored at room temperature or as specified by the manufacturer or vendor.

7.2.2. As of this writing, only PFOS, PFOA, PFNA, PFHxS, FOSA, Et-FOSA, Me-FOSA, Et-FOSE, Me-FOSE, Et-FOSAA and Me-FOSAA are commercially available as technical mixtures. These reference standards of the technical mixtures for these specific PFAS are used to ensure that all appropriate peaks are included during peak integration.

7.2.3. If solid material is used for preparing a standard, stock standard solutions are prepared from the solids and are stored at 0 - 6°C. Stock standard solutions should be brought to room temperature before using. Standards are monitored for signs of degradation or evaporation. Standard solutions must be replaced at least annually from the date of preparation.

7.2.3.1. If using solid material, be certain to account for the density of the material when preparing the standard. See *SAC-QA-SOP71665* for more details.

7.2.4. PFBS, PFHxS, PFHpS, PFOS, PFDS, and many other PFAS are not available in the acid form, but rather as their corresponding salts, such as sodium or potassium. The standards are prepared and corrected for their salt content according to the equation below.

$$Mass_{acid} = \text{Measured } Mass_{salt} \times MW_{acid} / MW_{salt}$$

Where: MW_{acid} is the molecular weight of PFAA

MW_{salt} is the molecular weight of the purchased salt.

For example, the molecular weight of PFOS is 500.1295 and the molecular weight of NaPFOS is 523.1193. Therefore, the amount of NaPFOS used must be adjusted by a factor of 0.956.

7.2.5. For the primary source calibration solutions, individual solutions for each PFAS (both native and isotopically labelled) are purchased from Wellington Laboratories, or other reputable vendors, and are predominantly at a concentration of 50 ug/mL in basic methanol. In the case of the sulfonic compounds, the concentration is 50 ug/mL of the alkali (potassium or sodium) salt. The laboratory uses the concentration of the acid form when determining the concentration of individual sulfonic acids in solution (See Section 7.2.4 above). See *SAC-QA-SOP71665* for details about solutions being in basic conditions to prevent esterification.

7.2.6. While PFAS standards commercially purchased are supplied in glass ampoules, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene or HDPE containers. Vortex all standard solutions prior to removing aliquots.

7.3. 1633 /LCS (LCS/Matrix PFC Spike Solution), 15-100 ng/mL (nominal) in 250 ml of a mixed stock solution in methanol at a nominal concentration listed below. This mixed stock is used as the spiking solution during sample preparation, as well an intermediate for the calibration curve, using the recipe below:

Table 7.3
1633 IM/LCS Solution Recipe
The solutions below are combined and diluted to 250 mL in methanol

Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	1633 IM/LCS Conc. (µg/mL)	Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	1633 IM/LCS Conc. (µg/mL)
PFBA	50	0.200	0.040	6:2 FTS	47.4	0.200	0.0381
PFPeA	50	0.100	0.020	8:2 FTS	47.9	0.200	0.0384
PFHxA	50	0.100	0.020	FOSA	50	0.100	0.020
PFHpA	50	0.100	0.020	Me-FOSA	50	0.100	0.020
PFOA	50	0.100	0.020	Et-FOSA	50	0.100	0.020
PFNA	50	0.100	0.020	Me-FOSAA	50	0.100	0.020
PFDA	50	0.100	0.020	Et-FOSAA	50	0.100	0.020
PFUdA	50	0.100	0.020	Me-FOSE	50	0.500	0.100
PFDoA	50	0.100	0.020	Et-FOSE	50	0.500	0.100
PFTrDA	50	0.100	0.020	HFPO-DA	50	0.075	0.015
PFTeDA	50	0.100	0.020	4,8-dioxa-3H- PFNA (DONA)	47.1	0.100	0.0189
PFBS	44.2	0.100	0.0178	PFMPA (PFECA F)	50	0.100	0.020
PFPeS	46.9	0.100	0.0188	PFMBA (PFECA A)	50	0.100	0.020
PFHxS	45.5	0.100	0.0182	NFDHA (PFECA B)	50	0.100	0.020
PFHpS	47.6	0.100	0.0191	9CI-PF3ONS	46.6	0.100	0.0187
PFOS	46.6	0.100	0.0186	11CI-PF3OUdS	47.1	0.100	0.0188
PFNS	48	0.100	0.0192	PFEESA (PES)	44.5	0.100	0.0178
PFDS	48.2	0.100	0.0193	3:3 FTCA	50	0.200	0.040
PFDoS	48.4	0.100	0.0194	5:3 FTCA	50	0.500	0.100
4:2 FTS	46.7	0.200	0.0375	7:3 FTCA	50	0.500	0.100
TFSI	97.84	0.050	0.0196	PFHxDA	50	0.1	0.020
PFPrA	50	0.500	0.100	PFODA	50	0.1	0.020
13C2-PFOA (PRC)	50	0.100	0.020				

7.4. 1633 Isotope Dilution Analyte Solution (Extracted Internal Standards), 23-62.5 ng/mL
The 1633-IDA solution is added to all samples prior to extraction and used as an intermediate solution for preparation of the instrument calibration standards. 200 mL of the solution at a nominal concentration of 0.025-0.0625 ug/mL (25-62.5 ng/mL) is prepared from the individual solutions described in Section 7.2.5 using the recipe below:

Table 7.4
1633-IDA Recipe
The solutions below are combined and diluted to 200 mL with Methanol.

IDA	Stock Conc. (µg/mL)	Aliquot (mL)	IDA Mix Conc. (µg/mL)	IDA	Stock Conc. (µg/mL)	Aliquot (mL)	IDA Mix Conc. (µg/mL)
13C4-PFBA	50	0.100	0.025	13C8-PFOS	47.8	0.100	0.0240
13C5-PFPeA	50	0.100	0.025	13C2-4:2FTS	46.7	0.250	0.0586

Table 7.4 1633-IDA Recipe The solutions below are combined and diluted to 200 mL with Methanol.							
IDA	**Stock Conc. (µg/mL)**	**Aliquot (mL)**	**IDA Mix Conc. (µg/mL)**	**IDA**	**Stock Conc. (µg/mL)**	**Aliquot (mL)**	**IDA Mix Conc. (µg/mL)**
13C5-PFHxA	50	0.100	0.025	13C2-6:2FTS	47.5	0.250	0.0595
13C4-PFHpA	50	0.100	0.025	13C2-8:2FTS	47.9	0.250	0.060
13C8-PFOA	50	0.100	0.025	13C8-FOSA	50	0.250	0.0625
13C9-PFNA	50	0.100	0.025	d3-MeFOSA	50	0.100	0.025
13C6-PFDA	50	0.100	0.025	d5-EtFOSA	50	0.100	0.025
13C7-PFUdA	50	0.100	0.025	d3-MeFOSAA	50	0.250	0.0625
13C2-PFDoA	50	0.100	0.025	d5-EtFOSAA	50	0.250	0.0625
13C2-PFTeDA	50	0.100	0.025	d7-Me-FOSE	50	0.250	0.0625
13C3-PFBS	46.5	0.100	0.0233	d9-Et-FOSE	50	0.250	0.0625
13C3-PFHxS	50	0.100	0.025	13C3-HFPO-DA	50	0.250	0.0625
13C3-PFPrA	50	0.100	0.025	13C2_PFHxDA	50	0.100	0.025

7.5. 1633 Internal Standard Solution, 23-62.5 ng/mL

The 1633 IS solution is added to all extracts prior to analysis and used as an intermediate solution for preparation of the instrument calibration standards. 200 mL of the solution at a nominal concentration of 0.025-0.0625 ug/mL (25-62.5 ng/mL) is prepared from the individual solutions described in Section 7.2.5 using the recipe below.

Table 7.5 1633-IS Recipe The solutions below are combined and diluted to 200 mL with Methanol.							
IDA	**Stock Conc. (µg/mL)**	**Aliquot (mL)**	**IDA Mix Conc. (ug/mL)**	**IDA**	**Stock Conc. (µg/mL)**	**Aliquot (mL)**	**IDA Mix Conc. (ug/mL)**
13C3-PFBA	50	0.100	0.0250	13C2-PFDA	50	0.100	0.0250
13C2-PFHxA	50	0.250	0.0625	18O2-PFHxS	47.3	0.100	0.0237
13C4-PFOA	50	0.250	0.0625	13C4-PFOS	47.8	0.100	0.0240
13C5-PFNA	50	0.100	0.0250				

7.6. Calibration Standards

Calibration solutions are prepared from the standards described in Sections 7.3, 7.4, and 7.5, above. For each level, a 200 mL volumetric flask is filled with 4 mL of water, and methanol added. The appropriate amount (see table below) of the solutions are added, and then the flask is filled to the mark with methanol to achieve the ratio of 95% methanol to 5% water, v/v.

Table 7.6 1633 Calibration Solution Recipe								
PFAS Standards	**Volume (mL) to add in 200 mL FV**							
	CS-1	**CS-2**	**CS-3**	**CS-4**	**CS-5**	**CS-6**	**CS-7**	**CS-8**
1633 IM/LCS (0.02 µg/mL)	0.250	0.500	1.25	5	10	25	50	100
1633 IDA Mix (0.025µg/mL)	8	8	8	8	8	8	8	8
1633 IS Mix (0.1-0.4 µg/mL)	8	8	8	8	8	8	8	8

7.6.1. Initial Calibration (ICAL) Levels (ng/mL)

Table 7.6.1 Initial Calibration Solution Concentrations (ng/mL)								
Compound	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**	**CS-6**	**CS-7**	**CS-8**
PFPrA	0.125	0.250	0.625	2.500	5.000	12.50	25.00	50.00
PFBA	0.050	0.100	0.250	1.000	2.000	5.000	10.00	20.00
PFPeA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFHxA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFHpA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFOA *	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFNA*	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFDA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFUdA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFDoA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFTrDA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFTeDA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFBS	0.022	0.044	0.111	0.444	0.888	2.220	4.440	8.880
PFPeS	0.024	0.047	0.118	0.470	0.940	2.350	4.700	9.400
PFHxS*	0.023	0.046	0.114	0.456	0.912	2.280	4.560	9.120
PFHpS	0.024	0.048	0.119	0.477	0.954	2.385	4.770	9.540
PFOS*	0.023	0.047	0.116	0.465	0.930	2.325	4.650	9.300
PFNS	0.024	0.048	0.120	0.481	0.962	2.405	4.810	9.620
PFDS	0.024	0.049	0.121	0.485	0.970	2.425	4.850	9.700
PFDoS	0.024	0.048	0.121	0.482	0.964	2.410	4.820	9.640
4:2 FTS	0.047	0.0935	0.234	0.934	1.868	4.670	9.340	18.68
6:2 FTS	0.048	0.0952	0.238	0.952	1.904	4.760	9.520	19.04

Table 7.6.1
Initial Calibration Solution Concentrations (ng/mL)

Compound	CS-1	CS-2	CS-3	CS-4	CS-5	CS-6	CS-7	CS-8
8:2 FTS	0.048	0.096	0.240	0.9600	1.92	4.800	9.600	19.20
FOSA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
Me-FOSA*	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
Et-FOSA*	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
MeFOSAA*	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
EtFOSAA*	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
Me-FOSE*	0.125	0.250	0.625	2.500	5.000	12.50	25.00	50.00
Et-FOSE*	0.125	0.250	0.625	2.500	5.000	12.50	25.00	50.00
HFPO-DA	0.018	0.038	0.094	0.375	0.750	1.875	3.750	7.500
DONA	0.024	0.047	0.118	0.473	0.946	2.365	4.730	9.460
PFMPA (PFECA F)	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFMBA (PFECA A)	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
NFDHA (PFECA B)	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
9Cl-PF3ONS	0.023	0.047	0.117	0.467	0.934	2.335	4.670	9.340
11CI-PF3OUdS	0.024	0.047	0.118	0.472	0.944	2.360	4.720	9.440
PFEESA (PES)	0.022	0.045	0.111	0.445	0.890	2.230	4.450	8.900
3:3 FTCA	0.050	0.100	0.250	1.000	2.000	5.000	10.00	20.00
5:3 FTCA	0.125	0.250	0.625	2.500	5.000	12.50	25.00	50.00
7:3 FTCA	0.125	0.250	0.625	2.500	5.000	12.50	25.00	50.00
TFSI	0.025	0.049	0.122	0.489	0.978	2.446	4.892	9.784
13C2-PFOA (PRC)	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFHxDA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
PFODA	0.025	0.050	0.125	0.500	1.000	2.500	5.000	10.00
Labeled Isotope Dilution Analytes (IDA)								
13C3-PFPrA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C4-PFBA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C5-PFPeA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C5-PFHxA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C4-PFHpA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C8-PFOA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C9-PFNA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C6-PFDA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C7-PFUdA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C2-PFDoA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C2-PFTeDA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C3-PFBS	0.932	0.932	0.932	0.932	0.932	0.932	0.932	0.932
13C3-PFHxS	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946
13C8-PFOS	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958
13C2-4:2 FTS	2.345	2.345	2.345	2.345	2.345	2.345	2.345	2.345
13C2-6:2FTS	2.380	2.380	2.380	2.380	2.380	2.380	2.380	2.380
13C2-8:2FTS	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400
13C8-FOSA	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
d3-MeFOSA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
d5-EtFOSA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
d3-MeFOSAA	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
d5-EtFOSAA	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
d7-Me-FOSE	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
d9-Et-FOSE	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
13C3-HFPO-DA	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
Internal Standard (IS)								
13C3-PFBA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C2-PFHxA	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
13C4-PFOA	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
13C5-PFNA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13C2-PFDA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
18O2-PFHxS	0.946	0.946	0.946	0.946	0.946	0.946	0.946	0.946
13C4-PFOS	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958

** Both branched and linear isomers are used.*
Note: *Sample extracts are in 95%/5% MeOH/H_2O.*
Note: *The above calibration levels are provided only as an example. The actual ICAL level used for each analytical batch will depend upon the LOQ requirements of the program.*

7.6.2. Additionally, a standard of the bile acids (TDCA, TUDCA and TCDA), at 1.0 ug/mL, that also contains the IDA and IS, is to be analyzed, after the initial calibration, and after the LCS, but prior to samples on non-ICAL days.

7.6.3. The bile salt standard is identified as WDM in the TALS/Chrom worklist.

7.6.4. The WDM should be linked to all samples in the WL.

7.7. Initial Calibration Verification Standard (ICV)

7.7.1. The ICV is prepared with individual stock solutions that are purchased from a vendor. When available, individual stock solutions are purchased from a vendor other than Wellington laboratories. If not available, a second laboratory chemist will prepare the intermediate mixed solution for the ICV.

7.7.1.1. ICV MIX: 10 mL of combined stock for the analytes listed below is created, using the recipe below, and methanol as the final solvent. This is stored in a polypropylene bottle at 0-6°C. This is valid for 6 months.

Table 7.7.1.1
ICV-MIX Recipe

Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	ICV-MIX Conc. (µg/mL)	Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	ICV-MIX Conc. (µg/mL)
11Cl-PF3OUdS	47.2	0.45	0.5	PFDA	50	0.4	2
9Cl-PF3ONS	46.7	0.45	0.5	PFDoA	50	0.4	2
br-NEtFOSAA	50	0.4	0.469	PFHpA	50	0.4	2
br-NMetFOSAA	50	0.4	0.476	PFHxA	50	0.4	2
br-PFNA	50	0.4	0.480	br-PFHxS	45.6	0.45	2.052
br-PFOA	50	0.4	0.482	br-PFOS	46.5	0.45	2.0925
NaDONA	47.3	0.45	0.489	PFTeDA	50	0.4	2
HFPO-DA	50	0.4	0.500	PFTrDA	50	0.4	2
PFBSA	44.4	0.45	0.484	PFUdA	50	0.4	2

7.7.2. ICV-IM: 10 mL of a combined stock for the analytes listed below is created, using the recipe below, and methanol as the final solvent:

Table 7.7.2
ICV-IM Recipe

Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	ICV-IM Conc. (µg/mL)	Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	ICV-IM Conc. (µg/mL)
PFBA	50	0.1	0.5	FOSA	50	0.1	0.5
PFPeA	50	0.1	0.5	Et-FOSA	50	0.1	0.5
PFPeS	46.9	0.1	0.469	Me-FOSA	50	0.1	0.5
PFHpS	47.6	0.1	0.476	Et-FOSE	50	0.1	0.5
PFNS	48	0.1	0.480	Me-FOSE	50	0.1	0.5
PFDS	48.2	0.1	0.482	4:2 FTS	46.7	0.1	0.467
TFSI	97.84	0.050	0.489	PFHxDA	50	0.1	0.5
PFPrA	50	0.1	0.500	PFODA	50	0.1	0.5
PFDoS	48.4	0.1	0.484	6:2 FTS	47.4	0.1	0.474
				8:2 FTS	47.9	0.1	0.479

7.7.3. ICV-IM2: 10 mL of a combined stock for the analytes listed below is created, using the recipe below, and methanol as the final solvent:

Table 7.7.3
ICV-IM2 Recipe

Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	ICV-IM Conc. (µg/mL)	Analyte	Stock Conc. (µg/mL)	Aliquot (mL)	ICV-IM Conc. (µg/mL)
3:3 FTCA	50	0.1	0.5	PFEESA (PES)	44.5	0.1	0.445
5:3 FTCA	50	0.1	0.5	PFMPA (PFECA F)	50	0.1	0.5
7:3 FTCA	50	0.1	0.5	PFMBA (PFECA A)	50	0.1	0.5
				NFDHA (PFECA B)	50	0.1	0.5

7.7.4. Finally, the ICV solution is created, at a nominal concentration of 2.5 ng/mL for target analytes (sulfonic acids slightly less), and the same concentrations as the calibration solutions for IS and IDA, by filling a 100 mL flask with 20 mL of water, then adding methanol. After adding the solutions below, the contents are diluted to the mark with methanol:

Table 7.7.4
1633 ICV Recipe

PFAS Standards	Volume (mL) to add in 100 mL FV
ICV MIX	0.125
1633 ICV_IM	0.5
1633 ICV_IM2	0.5
1633 EIS Mix	4
1633 NIS Mix	4

7.7.5. The screening internal standard is created at a nominal concentration of 1.05 ng/mL by filling a 100 mL flask with 60 mL of methanol. After adding the solution below, the contents are diluted to mark with methanol.

Table 7.7.5 1633 Screening Internal Standard	
PFAS Standards	**Volume (mL) to add in 100 mL FV**
1633 EIS Mix	4.2
1633 NIS Mix	4.2

8) Sample Collection, Preservation, Shipment and Storage

Laboratory default requirements for sample containers, sample size, preservation and holding time are detailed in the table below.

Table 8 Sample Collection, Preservation, and Storage Requirements				
Matrix	**Sample Container**	**Minimum Sample Size**	**Preservation**	**Holding Time[1]**
Water	125 mL HDPE Bottle	125 mL	0-6°C	28 days if 0-6°C or 90 days if stored at ≤ -20°C[2]
Soil/Sediment	4 oz. HDPE wide-mouth container	100 g	0-6°C	90 days[3]
Tissue	4 oz. HDPE wide-mouth container	50 g	≤ -20 °C	90 days[3]

[1] *Extraction holding time is calculated from date of collection. Analytical holding time is determined from date of extraction.*

[2] *By default, aqueous samples for Method 1633 are stored at 0-6 Centigrade and held for up to 28 days prior to extraction. Potential issues can be observed in aqueous samples with NMeFOSE, NEtFOSE, NMeFOSAA, and NEtFOSAA, after 7 days of storage at 0-6 C. These issues are more likely to elevate the observed concentrations of other PFAS compounds via the transformation of these precursors if they are present in the sample. Clients must inform the laboratory if these analytes are compounds of concern for the site.*

[3] *By default, soil and tissue samples for Method 1633 are stored at 0-6 Centigrade or frozen, respectively, and held for up to 90 days prior to extraction. Potential issues can be observed in samples with NFDHA after 3 days of collection. Clients must inform the laboratory if this analyte is a compound of concern for the site.*

8.1. Extracts are stored at 0 - 6°C and must be analyzed within 90 days of extraction.

8.2. Unless otherwise specified by client or regulatory program, after analysis, samples and extracts are retained for a minimum of 30 days after provision of the project report and then disposed of in accordance with applicable regulations.

8.3. Aqueous Samples

8.3.1. Procedures used to collect samples from still waters in particular must consider that enrichment. For example, if the purpose of the sampling is to characterize the PFAS content of the waterbody, samples should be collected from below the surface to avoid the enrichment in the surface layer. Conversely, if the purpose is to make a worse case assessment of the transfer of PFAS from the waterbody to the atmosphere or biota in contact with the surface layer, the sampling procedures should include the surface layer. The specific procedures used should be documented.

8.4. Compositing Samples

8.4.1. If composite sampling is requested, a manual composite sample can be created by collecting multiple small-volume samples in appropriately sized HDPE containers, manually combining them in a 125-mL HDPE container in the laboratory, rinsing each of the original containers with the basic methanol, using the rinsates to rinse the 125-mL containers, and then adding the combined rinsate to the SPE cartridge.

8.5. Biphasic samples

8.5.1. Samples denoted as aqueous (groundwaters, surface waters, and wastewaters) with less than 50 mg of solids content are prepared and handled as a liquid sample (Section 11.2). Compare the sample to a reference container with 50 mg solid content. Note in the benchsheet whether the sample passed the visual TSS evaluation or not. If the sample contains more than 50 mg solids, determine the total suspended solids (TSS) in the sample to then assess an appropriate dilution. ***(NOTE: Dilution due to TSS is not an option for DoD/DOE related samples unless prior client authorization has been provided.)*** If required contractually, contact the client for authorization to extract the sample at a smaller aliquot or as a solid. Detailed descriptions of any deviations from the procedure must be documented in the LIMS NCM program.
TSS Procedure (be certain to use the 125 mL container)

8.5.1.1. Use a pre-weighed filter (ProWeigh filter).

8.5.1.2. Label each dish with a sample identifier.

8.5.1.3. Scan each dish into the “Dish Value” field of the TALS batch.

8.5.1.4. Copy the documented weight into the TALS batch as the tare weight.

8.5.1.5. Assemble the needed filtering apparatus.

8.5.1.6. Insert the reweighed filter into the apparatus.

8.5.1.7. Condition the filter with 10 mL of reagent water.

8.5.1.8. Filter 10.0 ± 0.02 mL of well mixed sample through the filter.

8.5.1.9. Dry the filter for ~10 seconds by drawing vacuum through that single port.

8.5.1.10. Use tweezers to carefully transfer the filter from the filtering apparatus to its reweighed dish.

8.5.1.11. Dry the filter for a minimum of 1 hour at 104 ± 1°C.

8.5.1.12. Transfer the filter to a desiccator for 1 hour or until cool.

8.5.1.13. Weigh the filter and residue using the analytical balance in Gen Chem.

8.5.1.14. Enter this value into the TALS batch as the "WT1" value.

8.5.1.15. Make sure the following values are entered correctly into the TALS batch.

· Initial Amount = 10 mL
· Final Amount = 10 mL
· Nominal Amount Used = 10 mL (on batch information page)

8.5.1.16. TALS will calculate the TSS as follows:

Equation 1

$$TSS\left(\frac{mg}{L}\right) = \frac{Weight\ after\ drying\ (WT1)(mg) - Tare\ Weight\ (mg)}{0.01\ \mathrm{L}}$$

8.5.1.17. If the TSS >400 mg/L (50 mg/125 mL), then extract the sample at a reduced volume.

8.5.1.18. An appropriate dilution will target a TSS of <400 mg/L, i.e. if TSS = 800 mg/L then prep at 2X, if TSS = 3690 mg/L then prep at 10X, etc.

8.5.1.18.1. Factors of 2, 5 and 10 should be used when determining the appripriate dilution.

8.5.2. Samples considered solids (biosolids, sediments, and soils) are prepared and handled as solid samples following appropriate homogenization as per Section 11.5. Correction for moisture content prior to extraction is required, unless noted otherwise per client requirements. Use the percent moisture results in the LIMS to determine the appropriate amount to extract.

8.5.2.1. Use the "1633 Soil Sample Size Calculator" template found on the public drive\QA\Operations Spreadsheets.

8.5.2.2. Refer to the "Revision History & Information" tab for instructions.

8.5.3. In the event that results are required individually for the solid and aqueous phases of a sample, the phases are separated via centrifugation, and extracted separately using the appropriate preparation (Section 11.2 for the aqueous phase and Section 11.5 for the solid phase). The extracts are analyzed, and results reported for each phase separately.

9) Quality Control

9.1. Initial Demonstration of Capability (IDOC)
The initial demonstration and method detection limit (MDL) studies described in Section 13 must be acceptable before analysis of samples may begin.

9.2. Batches are defined at the sample preparation step. Batches should be kept together through the whole analytical process as far as possible, but it is not mandatory to analyze prepared extracts on the same instrument or in the same sequence. Refer to the QC program document (WS-PQA-003) for further details of the batch definition.

9.2.1. The quality control batch is a set of up to 20 samples of the same matrix processed using the same procedure and reagents within the same time period. The quality control batch must contain a low-level laboratory control sample (LLCS), a laboratory control sample (LCS), and a method blank. Laboratory generated QC samples (Blank, LLCS, LCS) do not count toward the maximum 20 samples in a batch. Field QC samples are included in the batch count. In some cases, at client request, a matrix spike/matrix spike duplicate (MS/MSD) or a sample duplicate (DU) may be included in the batch. In the event that multiple MS/MSDs or DUs are run with a batch due to client requirements, the additional MS/MSDs do not count toward the maximum 20 samples in a batch.

9.3. One method blank (MB, laboratory reagent blank) must be extracted with every process batch of similar matrix, not to exceed twenty (20) samples. For aqueous samples, the method blank is an aliquot of laboratory reagent water. For solid samples, the method blank is an aliquot of Ottawa sand wetted with reagent water. For tissue samples, the method blank is an aliquot of stored purchased chicken breast or tilapia. The method blank is processed in the same manner and at the same time as the associated samples. Corrective actions must be documented on a Non-Conformance memo, and then implemented when target analytes are detected in the method blank above the reporting limit or when IDA recoveries are outside of the control limits. Re-extraction of the blank, other batch QC and the affected samples are required when the method blank is deemed unacceptable. See policy *SAC-QA-P-QP71748* for specific acceptance criteria.

9.3.1. If the MB produces a peak within the retention time window of any of the analytes, determine the source of the contamination and eliminate the interference before processing samples.

9.3.2. The method blank must not contain any analyte at or above the reporting limit, greater than 1/3 the regulatory compliance limit or at or above 10% of the measured concentration of that analyte in the associated samples, whichever is higher.

9.3.2.1. DoD/DOE QSM: in addition to the above criteria, the method blank must not contain any analyte at or above ½ the reporting limit or LOQ.

9.3.3. If there is no target analyte greater than the RL in the samples associated with an unacceptable method blank, the data may be reported with qualifiers. Such action should be taken in consultation with the client.

9.3.4. Re-extraction and reanalysis of samples associated with an unacceptable method blank is required when reportable concentrations are determined in the samples.

9.3.5. Refer to *SAC-QA-P-QP71748* for further details of the corrective actions.

9.3.6. The position of the method blank in the SPE manifold during automated SPE extraction is rotated across batches.

9.4. A laboratory control sample (LCS), defined as OPR (on-going precision and recovery) in Method 1633, must be extracted with every process batch of similar matrix, not to exceed twenty (20) samples. The LCS is an aliquot of laboratory matrix (e.g. water for aqueous samples and Ottawa sand for solids) spiked with analytes of known identity and concentration. The LCS must be processed in the same manner and at the same time as the associated samples. Corrective actions must be documented on a Non-Conformance memo, then implemented when recoveries of any spiked analyte is outside of the control limits. Re-extraction of the blank, other batch QC, and all associated samples are required if the LCS is deemed unacceptable. See *SAC-QA-P-QP71748* for specific acceptance criteria.

9.4.1. The control limits for the LCS are stored in TALS and are the limits listed in the reference method. If the LCS is outside of control limits perform the following:

9.4.1.1. Re-analyze LCS extract. If acceptable, report.

9.4.1.2. If LCS has high bias and samples are ND, report and narrate.

9.4.1.3. If the LCS has a low bias, or if there are detections for critical chemicals of concern, evaluate and re-extract the LCS and all associated samples, if sufficient sample material is available.

9.4.2. For DoD/DOE QSM, the lower recovery limits based on historical values must be greater than or equal to 40%, unless the method specifies different.

9.5. Low-level LCS (LLCS), defined as LLOPR (low-level on-going precision and recovery) in Method 1633, must be extracted with every process batch of similar matrix, not to exceed twenty (20) samples. The LLCS is an aliquot of laboratory matrix (e.g. water for aqueous samples and Ottawa sand for solids) spiked with analytes of known identity and at a concentration of twice the RL. The LLCS must be processed in the same manner and at the same time as the associated samples. Corrective actions must be documented on a Non-Conformance memo, then implemented when recoveries of any spiked analyte is outside of the control limits. Re-extraction of the blank, other batch QC, and all associated samples are required if the LLCS is deemed unacceptable. See *SAC-QA-P-QP71748* for specific acceptance criteria.

9.5.1. The control limits for the LLCS are stored in TALS and are the limits listed in the reference method. If the LLCS is outside of control limits perform the following:

9.5.1.1. Re-analyze LLCS extract. If acceptable, report.

9.5.1.2. If LLCS has high bias and samples are ND, report and narrate.

9.5.1.3. If the LLCS has a low bias, or if there are detections for critical chemicals of concern, evaluate and re-extract the LCS and all associated samples, if sufficient sample material is available.

9.5.2. For DoD/DOE QSM, the lower recovery limits based on historical values must be greater than or equal to 40%, unless the method specifies different. The LCS/LLCS must be in control for DoD/DOE QSM batches, but a high bias and ND sample can be reported and narrated as this is specified in the reference method.

9.6. A laboratory duplicate (DU) is not required for this method but can be processed per client request. A DU is a second aliquot of a selected field sample that must be processed in the same manner and at the same time as the associated samples. Any RPD failures must be documented on a nonconformance memo. RPD limits are stored in TALS.

9.7. Matrix spikes are not required for this method because any deleterious effect of the matrix is evident in the recoveries of the IDA. A matrix spike/matrix spike duplicate (MS/MSD or MS/SD) can be processed per client request. An MS/MSD pair is aliquots of a selected field sample spiked with analytes of known identity and concentration. The MS/MSD pair must be processed in the same manner and at the same time as the associated samples. Spiked analytes with recoveries or precision outside of the control limits must be within the control limits in the LCS. Corrective actions must be documented on a nonconformance memo, and then implemented when recoveries of any spiked analyte are outside of the control limits provided by TALS or by the client. Recovery limits for MS/MSD are the same as those used for the LCS.

9.8. A laboratory control sample duplicate (LCSD) is required when insufficient sample volume is provided to process either a DU and/or MS/SD pair, or is requested by the client. The LCSD is evaluated in the same manner as the LCS. See *SAC-QA-P-QP71748* for specific acceptance criteria.

9.9. Instrument blanks (RB or CCB) are required at the beginning of an analytical sequence, after high-level samples (>UCL) and every CCV. The blank should contain IDA and IS to quantitate results. The blank should not contain any analyte > MDL. See *SAC-QA-P-QP71748* for specific acceptance criteria.

9.10. Initial calibration verification (ICV) –A second source standard is analyzed with the initial calibration curve. The concentration should be at the mid-range of the curve.
Corrective actions for the ICV include:
· Rerun the ICV.

- Remake or acquire a new ICV.
- Evaluate the instrument conditions.
- Evaluate the initial calibration standards.
- Rerun the initial calibration.

9.11. Isotope Dilution Analytes

9.11.1. The IDA solution is added to each field and QC sample at the time of extraction, as described in Section 11. As described in Section 7, this solution consists of isotopically labeled analogs of the analytes of interest.

9.11.2. IDA recoveries are flagged if they are outside of the acceptance limits stored in TALS. If IDA recoveries are outside of these limits, please check the following:

9.11.2.1. Check for errors and correct. Re-analyze the extract if needed.

9.11.2.2. IF IDA out high: ND samples, report and narrate.

9.11.2.3. If detections but IDA <200% (<350% for FTSs), report and narrate.

9.11.2.4. If detections and IDA >200% (>350% for FTSs), dilute 10X, re-analyze, report and narrate.

9.11.2.5. If IDA low, but >5% and S/N >10:1, narrate and report.

9.11.2.6. If IDA <5%, then contact client to re-extract at smaller aliquot.

9.11.3. For DoD/DOE QSM, limits based on historical recoveries (method defined) are required. (i.e. Sections 9.11.2.3 - 9.11.2.6 do not apply) If the IDA is not listed in the reference method, the lower recovery limit must be greater than or equal to 20%. If IDA recoveries are outside of these limits, additional clean-up is needed. If the recoveries cannot be met after clean-up then re-extract a smaller aliquot.

9.11.3.1. If the IDA recovery is just outside of the control limits, re-analyze the extract at 1X prior to re-extraction. If in control, report the data.

9.12. Ion Ratio

9.12.1. Compare the quantifier/qualifier SRM transition ratio in the sample to the SRM transition ratio in the standard.

$$Ion\ Ratio = \frac{Area\ Quantitation\ Ion\ (1°\ Transition)}{Area\ Qualitative\ Ion\ (2°\ Transition)}$$

Equation 2

9.12.2. The quantifier/qualifier SRM ion ratio should be within ±50% of the quantifier/qualifier SRM ion ratios calculated from the mid-level ICAL point.

9.12.2.1. Ion ratios must be in control in calibration solutions. If they are outside of limits, stop the analysis and correct the issues.

9.12.2.2. If data is reported to the MDL, the ratio should also be within ±50% of the quantifier/qualifier SRM ion ratios calculated from the initial daily CCV.

9.12.2.3. Please note that two transitions are monitored for PFPeA, but no corrective action is required if the ratio is outside of the limits due to the extremely poor response for the qualifier transition.

9.12.2.4. If the ion ratio is outside of the control limits review the following: Check for error, if none found report as outlined below.

9.12.2.5. If outside limits and value <RL report as ND at RL.

9.12.2.6. If outside limits but within 2X rule, report and narrate.

9.12.2.7. If ratio outside 2X rule then report as ND at elevated RL, apply G flag and narrate.

9.12.2.8. If the ratio is out due to branched isomer contribution, report as positive and narrate.

9.12.2.9. If outside limits and RT window due to matrix report as ND at elevated RL, apply G flag and narrate.

9.12.2.10. 2X Rule: If the ion ratio <0.5X the lower control limit or > 2X the upper control limit, then do not report the analyte. It should be either ND at the RL or elevate the RL as needed (G flag). As an example if the target ion ratio is 4.00. The Chrom determined limits are 2.00-6.00. If the ratio is < 1.00 (2.00 X 0.5) or > 12.00 (6.00 X 2) follow the specifications above.

9.12.3. For DoD/DOE QSM, if the ion ratio does not meet criteria after corrective actions, (extract clean-up, sample dilution, etc.), then data should be qualified "I" if the ratio is not met.

9.12.3.1. The 2X rule does NOT apply to DoD/DOE QSM samples.

9.13. Internal Standards
Internal standards (IS) are spiked into every field sample, QC sample, standard, and instrument blank. They are used for quantitation of the IDA.

9.13.1. The area of the IS in field and QC samples should be within 50-200% of the mean area corresponding IS in the most recent initial calibration, i.e. use CCVISAV.

9.13.2. If IS fails, re-analyze fresh aliquot of extract. If in control, report. If the failure confirms examine project specific requirements. Contact client as to additional measures to take.

10) Calibration

10.1. For details of the calculations used to generate the regression equations, and how to use the factors generated by these equations, refer to SOP *NDSC-QA-QP44940* "Calibration Curves and Selection of Calibration Points".

10.2. Routine instrument operating conditions are listed in the table in Section 11.9.

10.3. Instrument Tuning & Mass Calibration

10.3.1. Mass Calibration is performed by instrument manufacturer service representatives in accordance with the manufacturer's procedures during installation, and annually thereafter. In addition, the mass calibration must be verified with respect to the ion masses.

10.3.2. Instrument tuning is done initially when the method is first developed and thereafter as needed during troubleshooting. Tuning is done by infusing each individual compound (native and/or IDA) into the mobile phase using a tee fitting at a point just before the entrance to the electrospray probe. The responses for the parent and daughter ions for each compound are observed and optimized for sensitivity and resolution. Mass assignments are reviewed and updated as needed. The mass assignments must be within ± 0.5 amu of the values shown in the table in Section 11.9.

10.3.3. Once the optimal mass assignments (within ±0.5 amu of true) are made immediately following the initial tune, the lowest level standard from the initial calibration curve is assessed to ensure that a signal to noise ratio greater than 10 to 1 (S/N > 10:1) is achieved for each PFAS analyte. The first level standard from the initial calibration curve is used to evaluate the tune stability on an ongoing basis. The instrument mass windows are set initially at ± 0.5 amu of the true value; therefore, continued detection of the analyte transition with S/N > 10:1 serves as verification that the assigned mass remains within ± 0.5 amu of the true value, which meets the tune criterion.

10.4. A new calibration curve must be generated after major changes to the system or when the continuing calibration criteria cannot be met. Major changes include, but are not limited to, new columns or pump seals. A new calibration is not required after minor maintenance.

10.5. With the exception of the circumstances delineated in SOP *NDSC-QA-QP44940*, it is not acceptable to remove points from a calibration curve. In any event, at least six points must be included in the calibration curve. Average Response Factor and linear fit calibrations require six points.

10.6. A fixed injection volume is used for quantitation purposes and is to be the same for both the sample and standards.

10.7. All units used in the calculations must be consistently uniform, such as concentration in ng/mL.

10.8. Initial Calibration
Refer to Section 12.4.5 for details relating to setting retention times and evaluating retention times.

10.8.1. A number of analytical standards of different analyte concentrations are used to generate the curve. Each standard is injected once to obtain the peak response for each analyte at each concentration. These standards define the working range of the analysis.

10.8.1.1. A minimum of six analytical standards is used when using average response factor and/or linear calibration fits, five of which must be ≥ RL.

10.8.2. Calibration is by average response factor or linear fit.

10.8.2.1. For average response factor (RFa), the relative standard deviation (RSD) for all compounds must be ≤ 20% for the curve to be valid.

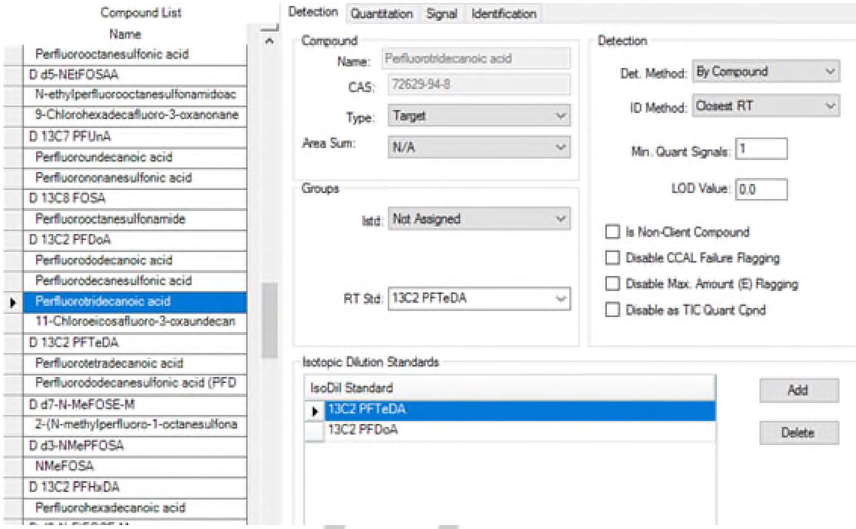
10.8.2.2. Alternatively, for average response factor (RFa), the relative standard error (RSE) for all compounds must be ≤ 20% for the curve to be valid.

10.8.2.3. For linear fits, the intercept of the line must be less than ½ the reporting limit, and the relative standard error (RSE) must be ≤ 20%.

10.8.2.4. While not a requirement, analyte read back should be 70-130% of the true value. The correlation coefficient, r, and the coefficient of determination, r^2, are no longer considered appropriate metrics for linearity and shall not be used in conjunction with this method.

10.8.2.5. Please note for this method PFTrDA is quantitated against the average areas of the IDA 13C2-PFTeDA and 13C2-PFDoA. In order to set this quantitation up correctly in Chrom, be certain to update the analyte PFTrDA per the example below (Figure 10.8.2.5).

Figure 10.8.2.5



10.9. Calibration Curve Fits

10.9.1. Linear regression or quadratic curves may be used to fit the data to a calibration function. Detailed descriptions and formulas for each fitting type can be found in SOP *NDSC-QA-QP44940*, "Calibration Curves and Selection of Calibration Points".

10.9.2. The Chrom data system is programmed to complement the calibration evaluation guidelines in policy *NDSC-QA-QP44940* by evaluating calibration curve fits in the order listed below. An optimal fit is recommended to the analyst, who may override based on evaluation of the residuals for each calibration level, as per SOP *NDSC-QA-QP44940*.
Average Response Factor
Linear, 1/concentration^2 weighting
Linear, 1/concentration weighting

10.9.3. The linear curve uses the following function:

$$y = bx + c$$

Equation 3
Where:

y = $\frac{Area\ (Analyte)}{Area\ (IDA)} \times Concentration(IDA)$
x = concentration
b = slope
c = intercept

10.9.4. Evaluation of Calibration Curves
The following requirements must be met for any calibration to be used:
The signal to noise ratio for each analyte with primary and confirmation masses must be greater than or equal to 3:1 and for those analytes with a single mass the signal to noise ratio must be greater than or equal to 10:1 in the lowest calibration standard.
Response must increase with increasing concentration.
The absolute value of the intercept of a regression line (linear or non-linear) at zero response must be less than the reporting limit.
There should be no carryover at or above 1/2 MRL after a high CAL standard.
If these criteria are not met, instrument conditions and standards will be checked, and the ICAL successfully repeated before continuing.

10.9.5. Weighting of Calibration Points
In linear and quadratic calibration fits, the points at the lower end of the calibration curve have less absolute variance than points at the high concentration end of the curve. This can cause severe errors in quantitation at the low end of the calibration. Because accuracy at the low end of the curve is very important for this analysis, it is preferable to increase the weighting of the lower concentration points. 1/concentration or 1/x weighting is encouraged. Visual inspection of the line fitted to the data is important in selecting the best fit.

10.9.6. Bile Salts Interference Check (Identified as WDM within TALS)
The laboratory must analyze a bile salts standard (TDCA, TCDA and TUDCA, plus IDA and IS) after the initial calibration and prior to the analysis of samples (at the beginning of the analytical sequence, after the LCS), to check for interferences caused by bile salts. The laboratory must establish chromatographic conditions to ensure the bile salt (TDCA) does not cause interference during the analysis of samples. To demonstrate successful separation the retention time of TDCA must be at least 1 minute outside the retention time window of the PFOS isomers. This is demonstrated as a comparison of the RT of TDCA (measured at the apex of the TCDA peak) separated by at least 1.4 minutes from the RT of the linear isomer of PFOS (measured at the apex of the peak of the linear isomer of PFOS). If adequate separation is not achieved, adjust the chromatographic conditions and reevaluate the separation of TDCA from PFOS.

10.10. Initial Calibration Blank (ICB)

10.10.1. Immediately following the ICAL, a calibration blank is analyzed that consists of an injection of final extract solvent containing both IDA and IS.

10.10.2. The result for the calibration blank must be less than the MDL.

10.10.3. If the ICB is greater than the MDL then the source of contamination must be identified and any necessary cleaning completed, and then the instrument should be recalibrated.

10.11. Initial Calibration Verification (ICV)

10.11.1. Following the ICAL and the ICB, an ICV standard obtained from a different source or vendor than the ICAL standards is analyzed. This ICV standard is a mid-range standard.

10.11.2. The recovery for the ICV must be equal to or within 70-130% for all natives and IDA.

10.11.3. See Section 9.10 for corrective actions in the event that the ICV does not meet the criteria above.

10.12. Continuing Calibration Verification (CCV)
Analyze a CCV at the beginning of a run, the end of a run, and after every 10 samples to determine if the calibration is still valid. The exception is after an acceptable curve and ICV are run 10 samples can be analyzed before a CCV is required. The CCVs are at the mid-level range of the curve. The curve and ICV do not need to be run every day. To start an analytical sequence on days when an ICAL is not performed, a CCVL (low standard at the RL) is analyzed at the beginning of the analytical sequenced and if it meets acceptance criteria, the analytical sequence can be started.

10.12.1. The recovery for the CCV standards must be equal to or within 70-130% for all natives and IDA.

10.12.1.1. If the analyte in a CCV fails due to high recovery, but that analyte is not detected in the sample extract, then the sample extract need not be re-analyzed, i.e. high and ND. Report the data with narration.

10.12.2. If this is not achieved, the instrument has drifted outside the calibration limits. The instrument must be recalibrated.

11) Procedure

11.1. One-time procedural variations are allowed only if deemed necessary in the professional judgment of a supervisor to accommodate variation in sample matrix, chemistry, sample size, or other parameters. Any variation in procedure shall be completely documented using a non-conformance memo (NCM). The NCM process is described in more detail in SOP *QA-SOP70881*. The NCM shall be filed in the project file and addressed in the case narrative.
Any deviations from this procedure identified after the work has been completed must be documented in an NCM, with a cause and corrective action described.
Differences for samples analyzed in accordance with the DoD/DOE QSM version 5.4 or higher are called out as needed in the procedures below.

11.2. Water Sample Preparation
NOTE: Any dilution or sub-sampling of the sample MUST be approved by the client, unless noted otherwise in the project/login notes.

11.2.1. Visually inspect samples for the presence of settled and/or suspended sediment/particulates. Samples > 50 mg solids should be mitigated. See Section starting at 8.5.1.1 for TSS procedure. Compare sample to comparison/reference bottle. If the sample should be processed as a solid or biphasic or reduced volume, contact the client for guidance prior to such action, if contractually required. Invert samples to homogenize prior to adding any spiking solutions.

11.2.1.1. If the TSS > 400 mg/L, centrifugation can be used to mitigate the sample in lieu of/or in conjunction with dilution.

11.2.1.2. If a DoD/DOE sample fails the TSS visual inspection then follow the instructions in Section 11.2.12., unless dilution is pre-authorized. See next section.
11.2.1.2.1. If a DoD/DOE program will allow for dilution, up to 5X, it must be pre-authorized by the client and project notes that indicating such.

11.2.2. Unknown samples may be screened prior to extraction using the following:

11.2.2.1. Pipet 50 uL of sample into a 1.5 mL vial.

11.2.2.2. Add 0.950 mL of the screen internal standard into the vial.

11.2.2.3. Vortex.

11.2.2.4. Submit for analysis.

11.2.2.5. The screening analysis is to follow the same analytical specifications as the definitive analysis, i.e. ICAL, CCV and all analytes.

11.2.2.6. Evaluate the screening results to determine the appropriate volume to extract:

- If < 1 ng/mL (on-column) = 1X (125 mL)
- If > 1 ng/mL but < 5 ng/mL = 10 X (12.5 mL)
- If > 5 ng/mL but < 50 ng/mL = 100X (1.25 mL)
- If > 50 ng/mL but < 500 ng/mL = 1000X (0.125 mL)
- If > 500 ng/mL but < 5000 ng/mL = 10,000X (0.0125 mL)

11.2.3. Weigh the sample container prior to extraction and then weigh the sample container after extraction to determine the initial volume. Unless otherwise directed by client, use the entire sample volume, and spike directly into the sample container.

11.2.3.1. If the sample is identified as a leachate, prep at 25 mL. The sample should be collected in an appropriately sized container, i.e., 25 mL. If a 25 mL volume container is not used, document as such and that a 25 mL aliquot was used for the analysis.

11.2.4. Prepare additional aliquots of a field sample for the DU and/or MS/MSD, if requested.

11.2.5. Prepare three 125 mL aliquots of HPLC-grade water for the method blank, LLCS, and LCS (LCSD if needed), dependent upon container type submitted by the client.

11.2.6. Check that the pH is 6.5 ± 0.5 using narrow range pH paper (Section 6.13). If necessary, adjust pH with acetic acid and/or NaOH.

11.2.7. Vortex the LCS/Matrix PFC Spike and IDA PFC solutions prior to use.

11.2.8. Add 0.200 mL of the EIS solution (Section 7.4) into each sample and QC sample, for a fixed concentration of 1-2.5 ng/mL in the final sample vial.

11.2.9. Spike the LCS/LCSD and MS/MSD (if requested) with 0.250 mL of the LCS/Matrix PFC Spike solution (Section 7.3), for a fixed concentration of 1-5 ng/mL in the final sample vial.

11.2.10. Spike the LLCS with the 25 uL of the LCS/Matrix PFS Spike solution (Section 7.3), for a fixed concentration of 0.1-0.5 ng/mL in the final sample vial.

11.2.11. Swirl or vortex all samples after adding spike solutions.

11.2.12. Allow samples to equilibrate for ~30 minutes before proceeding.

11.2.13. If a DoD/DOE sample fails TSS perform the following steps.

11.2.13.1. If needed, transfer the sample to centrifuge tubes, retaining the original sample container. If the client container will fit into the centrifuge do not transfer sample contents, i.e. spin in the original container.

11.2.13.2. Centrifuge the sample at ~1400 RCF (~2800 RPM) for ~10 minutes.

11.2.13.3. Decant the supernatant back into the original bottle for extraction, if transferred. If transferred into centrifuge tubes, retain tubes to rinse solid plug (residue) with two 5 mL rinses of reagent water prior to sample elution (Section 11.3.6).

11.2.13.3.1. This might mean having to interupt the automated SPE procedure if automation is used to extract the sample.

11.2.13.4. If centrifuged within the original container proceed to Section 11.2.13 being careful not to load the solid plug onto the SPE until the container is rinsed with elution solvent (Section 11.4.1).

11.2.13.5. Document via NCM that the sample required centrifugation.

11.2.13.6. If using the Promochrom for automated SPE, proceed to section 11.9.

11.3. Solid Phase Extraction (SPE) of Aqueous Samples

11.3.1. Condition the SPE cartridges by passing the following without drying the column.

11.3.1.1. Use Phenomenex 200 mg Wax / 10 mg GCB (Part # CS0-9218) or equivalent.

Note: *The cartridges should not be allowed to go dry until the final elution step with methanol. At all of the other transition steps, the solvent/sample level should be stopped at the top of the column before the next liquid is added.*

Warning: The use of a vacuum system creates the risk of glassware implosion. Inspect all glassware prior to use. Glassware with chips, scratches, rub marks, or cracks must not be used.

11.3.2. Wash with 5 mL of 0.3% NH_4OH/methanol.

11.3.3. Wash with 5 mL of 0.3M formic acid/H_2O. Close valve when ~ 200 uL remains on top to keep column wet. After this step, the columns cannot go dry until the completion of loading and rinsing samples.

11.3.4. Appropriately label the columns and add the reservoir to the column. Be certain to rotate method blank samples through each sample port on the automated SPE manifold units, such that each new batch uses a different port for the method blank. See PromoChrom (automated SPE manifold) logbook to determine port location from batch to batch. Due to the random association of components used in a manual SPE manifold unit, this is not a critical factor.

11.3.5. Pour the samples into the reservoirs attached to the SPE columns and with vacuum, pull the entire sample volume (125 mL) through the cartridge at a rate of approximately 2 to 5 drops per second.

11.3.5.1. If the SPE column should plug (flow rate <1 drop per minute) prior to the entire content of the sample container passing through the column do the following:

1. Stop adding sample to the reservoir.

2. Return any remaining sample volume back to the original container.
3. Weigh the original container and record this weight into the worksheet notes field within the TALS extraction batch.
4. Determine the full volume of sample fortified by using the "Gross Weight" –– default tare weight of a sample container (20.5 g).
5. Enter this value into the "Initial Amount" field in the TALS extraction batch.

6. Proceed to Section 11.4, noting that additional vacuum or pressure might be needed to elute the SPE column.

7. Should the SPE column plug, file an NCM stating such.

11.3.5.2. At least 50% of the sample must pass through the SPE column. If this does not occur then re-extract the sample at a reduced volume.

11.3.5.3. If a DoD/DOE sample plugs the SPE contact the PM immediately and initiate mitigation, i.e. centrifugation or dilution prior to re-extraction. This should all be performed in coordination with client approval.

11.3.6. After the entire sample has been loaded onto the column, rinse the sample container with a 5 mL aliquot of reagent water and pour into the column reservoir.

11.3.7. After the final loading of the sample but before completely passed through the column, rinse the SPE column with 1 mL water.

11.3.8. Vacuum dry for ~20 minutes.

11.3.9. Load the first 5 mL of 30:70 methanol:water, soak for ~5 minutes, and elute to waste. Load the second 5 mL 30:70 methanol:water and elute to waste.

11.3.10. Vacuum dry for ~15 minutes.

11.4. SPE Elution of Aqueous Samples – using 15 mL polypropylene test tubes as receiving tubes in the SPE manifold.

11.4.1. Add the collection tubes to the manifold. Rinse sample bottles with 5 mL of 0.3% NH_4OH/methanol and transfer to the column reservoir onto the cartridge. Elute the analytes from the cartridge by pulling the 0.3% NH_4OH/methanol through using low vacuum such that the solvent exits the cartridge in a dropwise fashion.

11.4.1.1. If the samples were fortified, centrifuged, and decanted prior to extraction, then elute the samples as follows.

11.4.1.1.1. Add elution solvent into the original parent bottle.

11.4.1.1.2. Shake the elution solvent in the bottle to ensure that all surfaces areas are washed.

11.4.1.1.3. Decant the elution solvent into the secondary bottle used for phase separation and proceed with the same shaking/mixing step as the parent bottle (Step 11.4.1.1.2).

11.4.1.1.4. Decant the solution into the first centrifuge tube. Repeat the step until all of the tubes are rinsed.

11.4.1.1.5. If necessary, re-centrifuge the final tube if the sediment has been stirred up. Load the final rinsed elution solvent into the cartridge for elution.

11.4.1.1.6. If the elution is split into two loading steps, then repeat the process.

11.4.2. Air dry and weigh the bottles (record as the tare weight in TALS) to get the sample volume extracted.

11.4.3. Vortex the IS solution prior to use.

11.4.4. Add 200 uL of NIS (Section 7.5) at 25-62.5 ng/mL concentration, into the centrifuge tube.

11.4.5. Add 0.25 mL of DI reagent water.

11.4.6. Adjust the volume to 5 mL with the eluting solvent. Cap and vortex.

11.4.7. This will generate a final extract that is 95:5 methanol: water.

11.4.8. Transfer a portion of the extract to a 0.3 mL polypropylene micro vial and submit for analysis. Archive the rest of the extract in a refrigerator for re-injection and dilution.

11.5. Solid, Biosolids, and Tissue Sample Preparation and Extraction

11.5.1. Visually inspect soil samples. Homogenize the entire sample in accordance with SOP WS-QA-0018. If the sample cannot be mixed in the container, pour into a larger QC'd PFAS-free container and mix thoroughly. Transfer the sample label to the new container.

11.5.2. All solid and biosolids samples must have their default mass increased by the percent moisture content prior to extraction. (Does not apply to tissue)

11.5.2.1. Review TALS for the percent moisture results. Use the following equation to determine what adjustment is needed to the default masses listed in Section 11.5.3.

11.5.2.1.1. Dry wt. adjusted mass = default mass X (1+ percent moisture as a decimal).

11.5.2.1.2. Do not add more that 2X the default mass, regardlesss of percent moisture value.

11.5.2.1.3. Use the "1633 Soil Sample Size Calculator" template found on the public drive\QA\Operations Spreadsheets.

11.5.2.1.4. Refer to the "Revision History & Information" tab for instructions.

11.5.3. Weigh a representative dry weight adjusted 2 g for soils, and 0.5 g for biosolids or a 2 g wet weight for tissue into a 50 mL centrifuge tube. Weigh additional sample amounts for the sample duplicate, matrix spike, and matrix spike duplicate analyses, if they are requested.

11.5.3.1. Do not batch solid sample, tissues and biosolids samples together due to the different masses.

11.5.4. For the method blank, LLCS and LCS matrix, use 2 g each of Ottawa sand or 0.5 g of Ottawa sand for biosolids. For tissue, use 2 gram of Tilapia.

11.5.5. Vortex the LCS/Matrix Spike and 1633 EIS solutions prior to use.

11.5.6. Add 0.200 mL of the 1633 EIS solution (Section 7.4) into each sample and QC sample, for a fixed concentration of 1-2.5 ng/mL in the final sample vial.

11.5.7. Spike the LCS and MS/MSD (if requested) with 0.250 mL of the LCS/Matrix Spike solution (Section 7.3), for a fixed concentration of 1 - 5 ng/mL in the final sample vial.

11.5.8. Spike the LLCS with 40 uL of the LCS/Matrix Spike solution (Section 7.3), for a fixed concentration of 0.16-0.80 ng/mL in the final sample vial.

11.5.9. Cap the tubes, vortex samples, and allow the spike to settle into the sample matrix for at least 30 minutes.

11.5.10. Add 10 mL of 0.4% KOH/methanol to each sample. Cap and vortex.

11.5.11. Extract the samples in an ultrasonic water bath for ~1 hour. The temperature of this water bath will be kept at ambient room temperature in a range of 16 - 25ºC.

11.5.12. After the completion of extraction, centrifuge each sample at ~3500 rpm for ~5 minutes.

11.5.13. Collect and decant the KOH/methanol into a new 125 mL container.

11.5.14. Add another 4 mL of 0.4% KOH/methanol solution to the residue, briefly shake to mix, and centrifuge at ~3500 rpm for ~5 minutes.

11.5.15. Combine the rinsate to the first corresponding 125 mL containers.

11.5.16. Bring the volume up to 125 mL with reagent water for each soil sample and 250 mL for tissue samples. Check that the pH is 6.5 ± 0.5 using narrow range pH paper (Section 6.13). If necessary, adjust pH with acetic acid and/or NaOH.

11.6. Solid Phase Extraction (SPE) of Solid, Biosolids and Tissue Samples

11.6.1. Condition the SPE cartridges by passing the following without drying the column.

11.6.1.1. Use Phenomenex 200mg Wax / 10mg GCB (Part# CS0-9218) or equivalent.

Note: *The cartridges should not be allowed to go dry until the final elution step with methanol. At all of the other transition steps, the solvent/sample level should be stopped at the top of the column before the next liquid is added.*

Warning: The use of a vacuum system creates the risk of glassware implosion. Inspect all glassware prior to use. Glassware with chips, scratches, rub marks, or cracks must not be used.

11.6.2. Wash with 5 mL of 0.3% NH_4OH/methanol.

11.6.3. Wash with 5mL of 0.3M formic acid/H_2O. Close valve when ~ 200 uL remains on top to keep column wet. After this step, the columns cannot go dry until the completion of loading and rinsing samples.

11.6.4. Appropriately label the columns and add the reservoir to the column. Be certain to rotate method blank samples through each sample port on the SPE manifold, such that each new batch uses a different port for the MB.

11.6.5. Add samples to the columns and with vacuum, pull the entire 125 mL aliquot of the sample through the cartridge at a rate of approximately 2 to 5 drops per second.

11.6.6. After the entire sample has been loaded onto the column, rinse the centrifuge tube with a 5 mL aliquot of reagent water and pour into the column reservoir.

11.6.7. After the final loading of the sample but before completely passed through the column, rinse the SPE column with 1 mL water.

11.6.8. Vacuum dry for ~20 minutes.

11.6.9. Load the first 5 mL of 30:70 methanol:water, soak for ~5 minutes, and elute to waste. Load the second 5 mL 30:70 methanol:water and elute to waste.

11.6.10. Vacuum dry for ~15 minutes.

11.7. SPE Elution of Solid, Biosolids and Tissue Samples – using 15 mL polypropylene test tubes as receiving tubes in the SPE manifold.

11.7.1. Rinse centrifuge tubes with 5 mL of 0.3% NH_4OH/methanol and transfer to the column reservoir onto the cartridge. Elute the analytes from the cartridge by pulling the 0.3% NH_4OH/methanol through using low vacuum such that the solvent exits the cartridge in a dropwise fashion.

11.7.1.1. For tissue samples elute with 2 – 5mL rinses of 0.3% NH_4OH/methanol.

11.8. Final volume for Solid, Biosolids and Tissue Sample extracts

11.8.1. Vortex the 1633 NIS solution prior to use.

11.8.2. Add 200 uL of 1633 NIS (Section 7.5) at 25-62.5 ng/mL concentration into a new centrifuge tube.

11.8.3. Add 250 uL of reagent water. (Add 500 uL of reagent water for tissues).

11.8.3.1. Tissue sample final volume (FV) = 10 mL.

11.8.4. Adjust the volume to 5 mL with the eluting solvent. Cap and vortex.

11.8.5. This will generate a final extract that is 95:5 methanol: water

11.8.6. Transfer a portion of the extract to a 0.3 mL polypropylene micro vial and submit for analysis. Archive the rest of the extract in a refrigerator for re-injection and dilution.

11.9. Automated Solid Phase Extraction using PromoChrom SPE-03.

Note: *Alwaus pre-clean the unit prior to use. Prior to setting up samples, check the label to confirm the container is from ESS as those lids will fit the PromoChrom units. If the containers are NOT from ESS, consult with your supervisor.*

11.9.1. Check solvent bottles for sufficient levels of solvent and check the level in the waste container. Solvents are tracked in the in the LCMS Reagent Logbook QA-876 located underneath the PromoChroms.

11.9.2. From the drop down menu, select "clean sys-004". This method will run as indicated below:

Table 11.9.2.1 Clean cycle for PromoChrom automated SPE	
Step 1	Clean sample lines with 6 mL of methanol at a flow rate of 20 mL/min.
Step 2	Clean sample lines with 5mL of methanol at a flow rate of 5 mL/min.
Step 3	Clean sample lines with 5mL of methanol at a flow rate of 5 mL/min.
Step 4	Remove methanol from sample bottle into waste of 8mL of sample at a flow rate of 15 mL/min.
Step 5	Clean rinse line with 6 mL of methanol into sample bottle at a flow rate of 20 mL/min.
Step 6	Purge air through sample lines with 3 mL at a flow rate of 20 mL/min.
Step 7	Clean sample lines with 5mL of methanol at a flow rate of 20 mL/min.
Step 8	Clean sample lines with 5mL of methanol at a flow rate of 20 mL/min.
Step 9	Remove methanol from sample bottle into waste of 10mL of sample at a flow rate of 15 mL/min.

11.9.3. After samples have been batched in TALS and fortified with isotope dilution analyte, they are ready to load onto the PromoChrom automated SPE unit.

11.9.4. Clean the adapters with methanol.

11.9.5. Remove the cleaning bottles from the unit and add the F-HC-30 Inline filter to the top of the cap, between the cap and the line leading into the PromoChrom. Then screw the sample bottles onto the clean caps.

11.9.6. Pierce the bottle on the top right corner using the provided lancet.

11.9.7. Install the new SPE cartridge by twisting them into the adapter.

11.9.7.1. Be certain to rotate the method blank samples through each sample port on the automated SPE manifold units, such that each new batch uses a different port for the method blank. See PromoChrom QA-589 (automated SPE manifold) logbook to determine port location from batch to batch. Due to the random association of components used in a manual SPE manifold unit, this is not a critical factor.

11.9.8. Set up labeled collection tubes into

11.9.9. From the dtop down menu, select '1633 Final/. This method will run as follows:

Table 11.9.9.1 1633 Final Run Cycle for PromoChrom Automated SPE	
Step 1	Condition cartridge with 15 mL of 0.3% Ammonium Hydroxide in Methanol at a flow rate of 8 mL/min.
Step 2	Condition cartridge with 5 mL of 0.3M Formic Acid in Water at a flow rate of 8 mL/min.
Step 3	Pouring sample through cartridge at a flow rate of 5 mL/min.

Step 4	Rinse bottle with 5 mL of reagent water with flow rate of 70 mL/min. Push 1 mL of air through rinse line.
Step 5	Remove 5 mL of reagent water with flow rate of 5 mL/min from the sample bottle to the cartridge.
Step 6	Shake sample bottle for 20 seconds.
Step 7	Remove any remaining volume from sample bottle at a flow rate of 5mL/min.
Step 8	Blow down cartridge with Nitrogen for 15 minutes.
Step 9	Rinse bottle with 5 mL of 30:70 Methanol:Water with a flow rate of 70 mL/min. Push 1 mL of air through rinse line..
Step 10	Remove 5 mL of 30:70 with flow rate of 5 mL/min from the sample bottle to the cartridge.
Step 11	Remove any remaining volume from sample bottle at a flow rate of 5mL/min.
Step 12	Shake sample bottle for 20 seconds.
Step 13	Air purge and remove any remaining volume from sample bottle at a flow rate of 5mL/min.
Step 14	Blow down cartridge with Nitrogen for 10 minutes.
Step 15	Pause step. Add Strata GCB 25mg/1mL IC Cartridge. Manually resume promochrom run.
Step 16	Rinse sample bottle with 0.3% NH4OH/MeOH and elute into collection tubes.
Step 17	Pause step. Ensure elution is completed before manually resuming run.
Step 18	End.

11.9.10. Take tare weight of empty sample bottles and proceed to section 11.4.3.

11.10. Instrument Analysis

Suggested operating conditions are listed in Tables 11.9-1 through 11.9-4 for the SCIEX LCMS systems:

Table 11.10 - 1 Recommended Instrument Operating Conditions				
HPLC Conditions (Shimadzu HPLC)				
Column (Column temp = 45°C)	**Acquity Peptide BEH C18 2.1 x 50 mm**			
Mobile Phase Composition	A = 5 mM Ammonium Acetate in Water B = ACN			
Gradient Program	Time	%A	%B	Flow Rate - mL/min
	0	95	5	0.35
	0.20	95	5	0.35
	1.30	90	10	0.35
	2.00	60	40	0.35
	6.00	50	50	0.35
	9.00	2	98	0.35
	11.0	2	98	0.35
	11.05	90	10	0.35
	12.5	90	10	0.35
	Maximum pressure limit = 8,000 psi			
Injection Size	5 mL (fixed amount throughout the sequence).			
Run Time	~12.50 min			
Mass Spectrometer Interface Settings (SCIEX 5500/7500)				
MS Interface Mode	ESI Negative Ion. Minimum of 10 scans/peak.			
Ion Spray Voltage (kV)	4.5 (5500) 1.55 (7500)			
Entrance Potential (V)	5			
Declustering Potential (V)	25			
Desolvation Temp	450ºC (5500) 325 ºC (7500)			
Curtain Gas	35 psi			
Collision Gas	8 psi			

Table 11.10 - 2 Masses/Transitions Utilized				
ID	**Comments**	**Q1**	**Q3**	**RT**
11CI-PF3OUdS	Native Analyte	630.9	450.9	8.31
11CI-PF3OUdS_2	Native Analyte	632.9	452.9	8.31
13C2_PFDA	Internal Standard	515.1	470.1	6.95
13C2_PFDoA	Isotope Dilution Analyte	615.1	570	7.86
13C2_PFHxA	Internal Standard	315.1	270	4.5
13C2_PFHXA_2	Internal Standard	315.1	119.4	4.5
13C2_PFTeDA	Isotope Dilution Analyte	715.2	670	8.68
13C3_HFPO-DA	Isotope Dilution Analyte	286.9	168.9	4.78
13C3_HFPO-DA_2	Isotope Dilution Analyte	286.9	184.9	4.78
13C3_PFBA	Internal Standard	216	172	1.87
13C3_PFBS	Isotope Dilution Analyte	302.1	79.9	4.36
13C3_PFBS_2	Isotope Dilution Analyte	302.1	98.9	4.36
13C3_PFHxS	Isotope Dilution Analyte	402.1	79.9	5.96
13C3_PFHxS_2	Isotope Dilution Analyte	402.1	98.8	5.96
13C4_PFBA	Isotope Dilution Analyte	216.8	171.9	1.87

Table 11.10 - 2 Masses/Transitions Utilized				
ID	**Comments**	**Q1**	**Q3**	**RT**
13C4_PFHpA	Isotope Dilution Analyte	367.1	322	5.25
13C2-PFOA (PRC)	Native Analyte	415	370	5.89
13C4_PFOA	Internal Standard	417.1	372	5.89
13C4_PFOS	Internal Standard	502.8	79.9	7.06
13C4_PFOS_2	Internal Standard	502.8	98.9	7.06
13C5_PFHxA	Isotope Dilution Analyte	318	273	4.5
13C5_PFHxA_2	Isotope Dilution Analyte	318	120.3	4.5
13C5_PFNA	Internal Standard	468	423	6.44
13C5_PFPeA	Isotope Dilution Analyte	268.3	223	3.51
13C6_PFDA	Isotope Dilution Analyte	519.1	474.1	6.95
13C7_PFUdA	Isotope Dilution Analyte	570	525.1	7.41
13C8_PFOA	Isotope Dilution Analyte	421.1	376	5.89
13C8_PFOS	Isotope Dilution Analyte	507.1	79.9	7.06
13C8_PFOS_2	Isotope Dilution Analyte	507.1	98.9	7.06
13C8_PFOSA	Isotope Dilution Analyte	506.1	77.8	7.91
13C9_PFNA	Isotope Dilution Analyte	472.1	427	6.44
18O2_PFHxS	Internal Standard	403	83.9	5.96
3:3 FTCA	Native Analyte	241	177	2.96
3:3 FTCA_2	Native Analyte	241	117	2.96
4.2FTS_2	Native Analyte	327.1	80.9	4.22
4:2 FTS	Native Analyte	327.1	307	4.22
5:3 FTCA	Native Analyte	341	237.1	4.85
5:3 FTCA_2	Native Analyte	341	217	4.85
6:2 FTS	Native Analyte	427.1	407	5.67
6:2 FTS_2	Native Analyte	427.1	80.9	5.67
7:3 FTCA	Native Analyte	441	316.9	6.14
7:3 FTCA_2	Native Analyte	441	336.9	6.14
8:2 FTS	Native Analyte	527.1	507	6.74
8:2 FTS_2	Native Analyte	527.1	80.8	6.74
9CI-PF3ONS	Native Analyte	530.8	351	7.4
9CI-PF3ONS_2	Native Analyte	532.8	353	7.4
d3MeFOSA	Isotope Dilution Analyte	515	219	9.45
d3-MeFOSAA	Isotope Dilution Analyte	573.2	419	6.98
d5EtFOSA	Isotope Dilution Analyte	531.1	219	9.77
d5-EtFOSAA	Isotope Dilution Analyte	589.2	419	7.17
d7N-MeFOSE	Isotope Dilution Analyte	623.2	58.9	9.32
d9N-EtFOSE	Isotope Dilution Analyte	639.2	58.9	9.64
DONA	Native Analyte	376.9	250.9	5.5
DONA_2	Native Analyte	376.9	84.8	5.5
EtFOSA	Native Analyte	526	219	9.79
EtFOSA_2	Native Analyte	526	169	9.79
HFPO-DA	Native Analyte	284.9	168.9	4.78
HFPO-DA_2	Native Analyte	284.9	184.9	4.78
M2-4:2FTS	Isotope Dilution Analyte	329.1	80.9	4.22
M2-4:2FTS_2	Isotope Dilution Analyte	329.1	309	4.22
M2-6:2FTS	Isotope Dilution Analyte	429.1	80.9	5.67
M2-6:2FTS_2	Isotope Dilution Analyte	429.1	409	5.67
M2-8:2FTS	Isotope Dilution Analyte	529.1	80.9	6.74
M2-8:2FTS_2	Isotope Dilution Analyte	529.1	509	6.74
MeFOSA	Native Analyte	511.9	219	9.45
MeFOSA_2	Native Analyte	511.9	169	9.45
N-EtFOSAA	Native Analyte	584.2	419.1	7.17
N-EtFOSAA_2	Native Analyte	584.2	526	7.17
N-EtFOSE	Native Analyte	630	58.9	9.66
NFDHA (PFECA B)	Native Analyte	295	201	4.36
NFDHA_2 (PFECA B_2)	Native Analyte	295	84.9	4.36
N-MeFOSAA	Native Analyte	570.1	419	6.98
N-MeFOSAA_2	Native Analyte	570.1	483	6.98
N-MeFOSE	Native Analyte	616.1	58.9	9.32
PFBA	Native Analyte	212.8	168.9	1.87
PFBS	Native Analyte	298.7	79.9	4.36
PFBS_2	Native Analyte	298.7	98.8	4.36
PFDA	Native Analyte	512.9	469	6.95
PFDA_2	Native Analyte	512.9	219	6.95
PFDoA	Native Analyte	613.1	569	7.86
PFDoA_2	Native Analyte	613.1	319	7.86
PFDoS	Native Analyte	699.1	79.9	8.83
PFDoS_2	Native Analyte	699.1	98.8	8.83
PFDS	Native Analyte	599	79.9	8
PFDS_2	Native Analyte	599	98.8	8
PFEESA (PES)	Native Analyte	314.8	134.9	4.8
PFEESA_2 (PES_2)	Native Analyte	314.8	82.9	4.8
PFHpA	Native Analyte	363.1	319	5.25

Table 11.10 - 2 Masses/Transitions Utilized				
ID	Comments	Q1	Q3	RT
PFHpA_2	Native Analyte	363.1	169	5.25
PFHpS	Native Analyte	449	79.9	6.54
PFHpS_2	Native Analyte	449	98.8	6.54
PFHxA	Native Analyte	313	269	4.5
PFHxA_2	Native Analyte	313	118.9	4.5
PFHxS	Native Analyte	398.7	79.9	5.96
PFHxS_2	Native Analyte	398.7	98.9	5.96
PFMBA (PFECA A)	Native Analyte	279	85.1	3.85
PFMPA (PFECA F)	Native Analyte	229	84.9	2.65
PFNA	Native Analyte	463	419	6.44
PFNA_2	Native Analyte	463	219	6.44
PFNS	Native Analyte	548.8	79.9	7.55
PFNS_2	Native Analyte	548.8	98.8	7.55
PFOA	Native Analyte	413	369	5.89
PFOA_2	Native Analyte	413	169	5.89
PFOS	Native Analyte	498.9	79.9	7.06
PFOS_2	Native Analyte	498.9	98.8	7.06
PFOSA	Native Analyte	498.1	77.9	7.93
PFOSA_2	Native Analyte	498.1	478	7.93
PFPeA	Native Analyte	263	219	3.51
PFPeA_2	Native Analyte	263	68.9	3.51
PFPeS	Native Analyte	349.1	79.9	5.27
PFPeS_2	Native Analyte	349.1	98.9	5.27
PFTeDA	Native Analyte	713.1	168.9	8.68
PFTeDA_2	Native Analyte	713.1	219	8.68
13C2 PFTeDA	Isotope Dilution Analyte	715.2	670	8.68
PFTrDA	Native Analyte	663	619	8.29
PFTrDA_2	Native Analyte	663	168.9	8.29
PFUdA	Native Analyte	563.1	519	7.41
PFUdA_2	Native Analyte	563.1	269.1	7.41
PFPrA	Native Analyte	163	119	1.2
13C3 PFPrA	Isotope Dilution Analyte	166	121	1.2
TFSI_1	Native Analyte	280.1	147.1	3.92
TFSI_2	Native Analyte	280.1	77.9	3.92
PFHxDA_1	Native Analyte	813	769	9.09
PFHxDA_2	Native Analyte	813	169	9.09
13C2 PFHxDA	Isotope Dilution Analyte	815	770	9.09
PFODA_1	Native Analyte	913	869	9.44
PFODA_2	Native Analyte	913	169	9.44
TCDA	Native Analyte	498.29	106.98	0
TCDCA	Native Analyte	498.29	123.90	0
TUDCA	Native Analyte	499.29	129.90	0

Table 11.10 – 3 Recommended Instrument Operating Conditions Mass Spectrometer Scan Settings (SCIEX 5500)							
RT	ID	MRM (win)	Dwell Weight	DP (volts)	EP (volts)	CE (volts)	CXP (volts)
0	TCDA	70	1	-65	-5	-58	-12
0	TCDCA	120	1	-65	-5	-58	-12
0	TUDCA	120	1	-65	-5	-58	-12
1.87	13C3_PFBA	90	1	-25	-5	-12	-31
1.87	13C4_PFBA	90	1	-25	-5	-12	-31
1.87	PFBA	90	1	-25	-5	-12	-31
2.65	PFMPA (PFECA F)	70	1	-23	-10	-10	-16
2.96	3:3 FTCA	70	1	-46	-10	-11	-13
2.96	3:3 FTCA_2	70	1	-33	-10	-44	-15
3.51	13C5_PFPeA	80	1	-55	-7	-12	-13
3.51	PFPeA	80	1	-55	-7	-12	-13
3.51	PFPeA_2	80	1	-55	-7	-62	-15
3.85	PFMBA (PFECA A)	70	1	-5	-10	-16	-9
4.22	4.2FTS_2	70	1	-60	-10	-50	-12
4.22	4:2 FTS	70	1	-50	-7	-32	-10
4.22	13C2-4:2FTS	70	1	-50	-7	-80	-10
4.22	13C2-4:2FTS_2	70	1	-50	-7	-32	-10
4.36	13C3_PFBS	70	1	-55	-6	-58	-37
4.36	13C3_PFBS_2	70	1	-55	-6	-58	-37
4.36	NFDHA (PFECA B)	70	1	-35	-10	-14	-17
4.36	NFDHA_2 (PFECA B_2)	70	1	-35	-10	-34	-5
4.36	PFBS	70	1	-55	-6	-58	-37
4.36	PFBS_2	70	1	-55	-5	-40	-12
4.5	13C2_PFHxA	50	1	-55	-5	-14	-13

Table 11.10 – 3
Recommended Instrument Operating Conditions
Mass Spectrometer Scan Settings (SCIEX 5500)

RT	ID	MRM (win)	Dwell Weight	DP (volts)	EP (volts)	CE (volts)	CXP (volts)
4.5	13C2_PFHXA_2	50	1	-55	-5	-26	-7
4.5	13C5_PFHxA	50	1	-60	-5	-12	-15
4.5	13C5_PFHxA_2	50	1	-60	-5	-30	-9
4.5	PFHxA	50	1	-55	-5	-14	-13
4.5	PFHxA_2	50	1	-55	-5	-26	-7
4.78	13C3_HFPO-DA	70	1	-15	-10	-5	-17
4.78	13C3_HFPO-DA_2	70	1	-75	-10	-18	-15
4.78	HFPO-DA	70	1	-15	-10	-5	-17
4.78	HFPO-DA_2	70	1	-75	-10	-18	-15
4.8	PFEESA (PES)	70	1	-98	-12	-28	-12
4.8	PFEESA_2 (PES_2)	70	1	-98	-12	-28	-12
4.85	5:3 FTCA	70	1	-10	-10	-18	-13
4.85	5:3 FTCA_2	70	1	-10	-10	-38	-11
5.25	13C4_PFHpA	70	1	-25	-6	-12	-41
5.25	PFHpA	70	1	-25	-6	-12	-41
5.25	PFHpA_2	70	1	-25	-6	-20	-10
5.27	PFPeS	70	1	-57	-9	-66	-40
5.27	PFPeS_2	70	1	-57	-9	-45	-12
5.5	DONA	70	1	-55	-10	-16	-17
5.5	DONA_2	70	1	-55	-10	-35	-17
5.67	6:2 FTS	70	1	-50	-7	-32	-10
5.67	6:2 FTS_2	70	1	-80	-10	-72	-12
5.67	13C2-6:2FTS	70	1	-50	-7	-90	-10
5.67	13C2-6:2FTS_2	70	1	-50	-7	-32	-10
5.89	13C2_PFOA (PRC)	70	1	-110	-6	-24	-20
5.89	13C4_PFOA	70	1	-110	-6	-24	-20
5.89	13C8_PFOA	70	1	-110	-6	-18	-20
5.89	PFOA	70	1	-110	-6	-18	-20
5.89	PFOA_2	70	1	-110	-6	-24	-20
5.96	13C3_PFHxS	65	1	-145	-12	-88	-11
5.96	13C3_PFHxS_2	65	1	-145	-12	-80	-13
5.96	18O2_PFHxS	65	1	-145	-12	-88	-11
5.96	PFHxS	65	1	-145	-12	-88	-11
5.96	PFHxS_2	65	1	-145	-12	-80	-13
6.14	7:3 FTCA	70	1	-27	-12	-18	-10
6.14	7:3 FTCA_2	70	1	-22	-12	-31	-35
6.44	13C5_PFNA	70	1	-25	-6	-14	-48
6.44	13C9_PFNA	70	1	-25	-6	-14	-48
6.44	PFNA	70	1	-25	-6	-14	-47
6.44	PFNA_2	70	1	-25	-6	-24	-47
6.54	PFHpS	70	1	-65	-11	-88	-46
6.54	PFHpS_2	70	1	-65	-11	-50	-12
6.74	8:2 FTS	70	1	-50	-7	-40	-15
6.74	8:2 FTS_2	70	1	-60	-10	-82	-9
6.74	13C2-8:2FTS	70	1	-50	-7	-90	-15
6.74	13C2-8:2FTS_2	70	1	-50	-7	-40	-15
6.95	13C2_PFDA	70	1	-25	-6	-16	-51
6.95	13C6_PFDA	70	1	-25	-6	-16	-51
6.95	PFDA	70	1	-25	-6	-16	-51
6.95	PFDA_2	70	1	-25	-6	-26	-12
6.98	d3-MeFOSAA	90	1	-40	-7	-36	-15
6.98	N-MeFOSAA	90	1	-40	-7	-36	-15
6.98	N-MeFOSAA_2	90	1	-75	-10	-22	-12
7.06	13C4_PFOS	90	1	-140	-9	-130	-13
7.06	13C4_PFOS_2	90	1	-140	-9	-98	-5
7.06	13C8_PFOS	90	1	-205	-9	-112	-11
7.06	13C8_PFOS_2	90	1	-205	-9	-112	-11
7.06	PFOS	90	1	-140	-9	-130	-13
7.06	PFOS_2	90	1	-140	-9	-98	-5
7.17	d5-EtFOSAA	90	1	-50	-7	-36	-15
7.17	N-EtFOSAA	90	1	-50	-7	-36	-15
7.17	N-EtFOSAA_2	90	1	-90	-10	-28	-12
7.4	9CI-PF3ONS	70	1	-120	-10	-30	-17
7.4	9CI-PF3ONS_2	70	1	-120	-10	-30	-15
7.41	13C7_PFUdA	70	1	-25	-7	-18	-54
7.41	PFUdA	70	1	-25	-7	-18	-54
7.41	PFUdA_2	70	1	-25	-7	-28	-12
7.55	PFNS	70	1	-75	-10	-113	-52
7.55	PFNS_2	70	1	-75	-8	-71	-12
7.86	13C2_PFDoA	70	1	-25	-5	-18	-54
7.86	PFDoA	70	1	-25	-5	-18	-54

Table 11.10 – 3 Recommended Instrument Operating Conditions							
Mass Spectrometer Scan Settings (SCIEX 5500)							
RT	**ID**	**MRM (win)**	**Dwell Weight**	**DP (volts)**	**EP (volts)**	**CE (volts)**	**CXP (volts)**
7.86	PFDoA_2	70	1	-25	-5	-30	-12
7.91	13C8_PFOSA	75	1	-90	-8	-92	-11
7.93	PFOSA	75	1	-90	-8	-92	-11
7.93	PFOSA_2	75	1	-60	-10	-40	-8
8	PFDS	70	1	-30	-11	-130	-11
8	PFDS_2	70	1	-30	-11	-110	-17
8.29	PFTrDA	90	1	-25	-7	-20	-54
8.29	PFTrDA_2	90	1	-25	-7	-36	-12
8.31	11CI-PF3OUdS	70	1	-160	-10	-40	-17
8.31	11CI-PF3OUdS_2	70	1	-160	-10	-40	-15
8.68	13C2_PFTeDA	120	1	-25	-7	-22	-54
8.68	PFTeDA	120	1	-25	-7	-22	-10
8.68	PFTeDA_2	120	1	-25	-7	-36	-30
8.83	PFDoS	90	1	-10	-11	-76	-11
8.83	PFDoS_2	90	1	-10	-11	-130	-5
9.32	d7N-MeFOSE	70	1	-20	-5	-70	-10
9.32	N-MeFOSE	70	1	-20	-5	-70	-10
9.45	d3MeFOSA	70	1	-75	-7	-37	-15
9.45	MeFOSA	70	1	-75	-7	-37	-15
9.45	MeFOSA_2	70	1	-50	-2	-40	-6
9.64	d9-N-EtFOSE	70	1	-20	-5	-70	-10
9.66	d5N-EtFOSE	70	1	-20	-5	-70	-10
9.77	d5-EtFOSA	70	1	-75	-7	-37	-15
9.79	EtFOSA	70	1	-75	-7	-37	-15
9.79	EtFOSA_2	70	1	-50	-8	-40	-6
1.2	PFPrA	60	1	-5	-10	-16	-13
1.2	13C3_PFPrA	60	1	-5	-10	-16	-13
3.92	TFSI_1	60	1	-130	-7	-36	-9
3.92	TFSI_2	60	1	-130	-7	-106	-11
9.09	PFHxDA_1	90	1	-25	-7	-24	-54
9.09	PFHxDA_2	90	1	-25	-7	-38	-12
9.09	13C2_PFHxDA	90	1	-25	-7	-24	-54
9.44	PFODA_1	90	1	-25	-7	-26	-54
9.44	PFODA_2	90	1	-25	-7	-40	-12

Table 11.10 – 4 Retention Times & Quantitation				
Native Compounds	**Typical Native RT (minutes)**	**IDA analog**	**Typical IDA RT (minutes)**	**Quantitation Method**
PFBA	2.54	13C4_PFBA	2.54	Isotope Dilution
3:3 FTCA	2.9	13C5_PFPeA	2.98	Isotope Dilution
PFPeA	2.97	13C5_PFPeA	2.97	Isotope Dilution
PFBS	2.98	13C3_PFBS	2.98	Isotope Dilution
PFECA A (PFMBA)	3	13C5_PFPeA	2.97	Isotope Dilution
PES (PFEESA)	3.09	13C5_PFHxA	2.98	Isotope Dilution
PFECA B (NFDHA)	3.21	13C5_PFHxA	3.35	Isotope Dilution
4:2 FTS	3.28	13C2_4:2FTS	3.28	Isotope Dilution
PFHxA	3.35	13C5_PFHxA	3.35	Isotope Dilution
PFPeS	3.45	13C3_PFHxS	2.98	Isotope Dilution
HFPO-DA	3.46	13C3_HFPO-DA	3.46	Isotope Dilution
5:3 FTCA	3.7	13C5_PFHxA	3.77	Isotope Dilution
PFECA_F (PFMPA)	3.08	13C5_PFPeA	3.77	Isotope Dilution
PFHpA	3.74	13C4_PFHpA	3.74	Isotope Dilution
PFHxS	3.74	13C3_PFHxS	3.74	Isotope Dilution
DONA	3.79	13C3_HFPO-DA	4.5	Isotope Dilution
6:2 FTS	4.12	13C2_6:2FTS	4.12	Isotope Dilution
PFOA	4.14	13C8_PFOA	4.14	Isotope Dilution
13C2_PFOA (PRC)	4.14	13C8_PFOA	4.14	Isotope Dilution
PFHpS	4.14	13C8_PFOS	4.5	Isotope Dilution
7:3 FTCA	4.5	13C5_PFHxA	4.55	Isotope Dilution
PFOS	4.5	13C8_PFOS	4.5	Isotope Dilution
PFNA	4.52	13C9_PFNA	4.52	Isotope Dilution
9CI-PF3ONS	4.69	13C3_HFPO-DA	4.5	Isotope Dilution
PFOSA	4.82	13C8_PFOSA	4.82	Isotope Dilution
PFNS	4.83	13C8_PFOS	4.5	Isotope Dilution
PFDA	4.86	13C6_PFDA	4.86	Isotope Dilution
8:2 FTS	4.86	13C2_8:2FTS	4.86	Isotope Dilution
N-MeFOSAA	5.03	d3-MeFOSAA	5.03	Isotope Dilution

Table 11.10 – 4 Retention Times & Quantitation				
Native Compounds	**Typical Native RT (minutes)**	**IDA analog**	**Typical IDA RT (minutes)**	**Quantitation Method**
PFDS	5.16	13C8_PFOS	4.5	Isotope Dilution
PFUdA (PFUnA)	5.19	13C7_PFUdA	5.19	Isotope Dilution
N-EtFOSAA	5.19	d5-EtFOSAA	5.19	Isotope Dilution
N-MeFOSE	5.25	d7N-MeFOSE	5.25	Isotope Dilution
MeFOSA	5.26	d3-MeFOSA	5.26	Isotope Dilution
11Cl-PF3OUdS	5.31	13C3_HFPO-DA	4.5	Isotope Dilution
N-EtFOSE	5.4	d9N-EtFOSE	5.4	Isotope Dilution
EtFOSA	5.44	d5-EtFOSA	5.44	Isotope Dilution
PFDoA	5.47	13C2_PFDoA	5.47	Isotope Dilution
PFDoS	5.72	13C8_PFOS	4.5	Isotope Dilution
PFTrDA	5.75	13C2_PFDoA/13C2_PFTeDA	5.47	Isotope Dilution
PFTeDA	5.99	13C2_PFTeDA	5.99	Isotope Dilution
PFPrA	1.2	13C3_PFPrA	1.2	Isotope Dilution
TFSI	3.92	13C4_PFBA	2.09	Isotope Dilution
PFHxDA	9.09	13C2_PFHxDA	9.09	Isotope Dilution
PFODA	9.44	13C2_PFHxDA	9.09	Isotope Dilution

Table 11.10 – 5 Retention Times & Quantitation				
IDA	**Typical IDA RT (minutes)**	**IS analog**	**Typical RT (minutes)**	**Quantitation Method**
13C4_PFBA	2.08	13C3_PFBA	2.09	Internal Standard
13C5_PFPeA	3.71	13C2_PFHxA	4.62	Internal Standard
13C5_PFHxA	4.62	13C2_PFHxA	4.62	Internal Standard
13C4_PFHpA	5.34	13C2_PFHxA	4.62	Internal Standard
13C8_PFOA	5.94	13C4_PFOA	5.94	Internal Standard
13C9_PFNA	6.43	13C5_PFNA	4.52	Internal Standard
13C6_PFDA	6.88	13C2_PFDA	4.86	Internal Standard
13C7_PFUnA	7.32	13C2_PFDA	6.88	Internal Standard
13C2_PFDoA	7.72	13C2_PFDA	6.88	Internal Standard
13C2_PFTeDA	8.42	13C2_PFDA	6.88	Internal Standard
13C3_PFBS	4.50	18O2_PFHxS	6.00	Internal Standard
13C3_PFHxS	6.00	18O2_PFHxS	6.00	Internal Standard
13C8_PFOS	6.98	13C4_PFOS	6.98	Internal Standard
13C2_4:2FTS	4.41	18O2_PFHxS	6.00	Internal Standard
13C2_6:2FTS	5.75	18O2_PFHxS	6.00	Internal Standard
13C2_8:2FTS	6.72	18O2_PFHxS	6.00	Internal Standard
13C8_PFOSA	8.01	13C4_PFOS	6.98	Internal Standard
d3-MeFOSA	9.49	13C4_PFOS	6.98	Internal Standard
d5-EtFOSA	9.81	13C4_PFOS	6.98	Internal Standard
d3-MeFOSAA	6.93	13C4_PFOS	6.98	Internal Standard
d5-EtFOSAA	7.10	13C4_PFOS	6.98	Internal Standard
d7N-MeFOSE	9.37	13C4_PFOS	6.98	Internal Standard
d9N-EtFOSE	9.68	13C4_PFOS	6.98	Internal Standard
13C3_HFPO-DA	4.90	13C2_PFHxA	4.62	Internal Standard
13C3_PFPrA	1.2	13C3_PFBA	2.09	Internal Standard
13c2_PFHxDA	9.09	13C2_PFDA	6.88	Internal Standard

11.10.1. Tune and calibrate the instrument as described in Section 10.

11.10.2. A typical analytical sequence is as follows:

- Rinse Blank (RB, not linked to anything)
- CCVL (referred to as an ISC in Method 1633)
- CCVISAV
- Rinse Blank (RB, not linked to anything)
- Method blank
- LLCS
- LCS
- WDM (Bile salt interference check)
- 10 samples
- CCV: link to CCVISAV
- CCB
- 10 more samples
- CCV: link to CCVISAV
- CCB
- Etc.

11.11. Vortex all sample aliquots and standards prior to placing on the autosampler.

11.12. Samples analyzed subsequent to any sample with results at or above the upper calibration limit must be evaluated for potential carryover, and corrective actions taken, as detailed below.

11.12.1. If carryover is suspected, those samples are to be re-analyzed from a fresh extract aliquot (i.e., go aliquot the archive of the extract).

11.12.2. Should there be instrument contamination, as evident by sample carryover, any sample >5X the UCL or instrument blanks with detections > RL:
· Analyze 20 blanks alternating between 1% formic acid/methanol and 1% formic acid/water.
· Then analyze 3 methanol only blanks.
· If the system is clean, resume analyses. Proceed to 11.11.4. If not clean, proceed as directed below.

11.12.3. If the system is still contaminated the following items might need to be cleaned or replaced:
· Reverse flush the analytical column.
· Reverse flush the isolation column.
· Replace the column (isolation, analytical or both).
· Clean the cones/entry port.
· Replace the PEEK tubing in the sample pathway.
· Then, repeat 11.11.2.

11.12.4. Should a high-level sample be analyzed that triggers these steps then detections for those analytes over the next 2-3 days require additional evaluation (are all instrument blanks from the sequence < ½ RL) and possible re-analysis. If sample results replicate and the associated instrument blanks from the sequences are <1/2 RL, then one can assume the system is under control and confirmation of positive detections can stop.

12) Calculations/Data Reduction

12.1. If the concentration of the analyte ions exceeds the working range as defined by the calibration standards, then the sample might require to be diluted and reanalyzed, based upon client need. It may be necessary to dilute samples due to matrix.

12.1.1. Evaluate the extract for saturation. If present, dilute and re-analyze. If not, laboratory default procedure is to flag and report.

12.1.2. The IDA recoveries in the diluted extract are to meet acceptance limits stored in TALS and have S/N ≥ 20:1.

12.2. For DoD/DOE QSM, the sample results must be within the calibration range. The extracts can be diluted up to no more than 100X without diluting out the IDA, in some cases, and thus preserving quantitation via isotope dilution. IDA recovery must be >5% in the dilution.

12.2.1. If larger than a 100X dilution is needed contact client for course of action.

12.3. Results less than the reporting limit are flagged in the client report as estimated. Generally, the "J" flag is used to denote ≥ MDL and ≤ RL, but the specific flag may change based on client requirements.

12.4. Qualitative Identification

12.4.1. The IS areas in the field samples and the QC samples must be within 50-200% of the mean area of the corresponding IS in the most recent initial calibration. Results for the target analytes are recovery corrected by the method of quantification. IDA recoveries are determined against the IS and are used as general indicators of overall analytical quality. The IS has no impact on the target analyte result.

12.4.2. The ratio requirement does not apply for PFPrA, PFBA, PFPeA, NMeFOSE, NEtFOSE, PFMPA, and PFMBA. Many of the IDA and IS compounds do not produce useful confirmation ions under the instrumental operating parameters. Therefore, monitoring the confirmation ions for the IDA and IS compounds is optional.

12.4.3. The retention times of PFAS with labeled standards should be the same as that of the labeled IDA's to within 0.1 min. For PFAS with no labeled standards, the RT must be within ± 0.4 minutes of the ICAL or the most recent CCV standard.

Note: *The IDA RT and native RT may be offset by 0.02 to 0.04 minutes.*

12.4.4. PFBS, PFHxS, PFOS, PFOA, PFNA, Me-FOSE, Et-FOSE, FOSA, Me-FOSA, Et-FOSA, Me-FOSAA, and Et-FOSAA have multiple chromatographic peaks using the LC conditions specified in the method due to the linear and branch isomers of these compounds. Most PFAS compounds are produced by one of two processes. One gives rise to linear PFAS only while the other process produces both linear and branched isomers. Both branched and linear PFAS compounds can potentially be found in the environment. For the aforementioned compounds that give rise to more than one peak, all chromatographic peaks observed in the standard must be integrated and the areas totaled. Chromatographic peaks in the sample must be integrated in the same way as the calibration standard and concentrations reported as a total for each of these analytes.

12.4.5. The expected retention times (RT) are established in the Chrom data processing module during the processing of the ICAL by selecting Edit>Method>Update RT. Once the retention times are established Chrom will look for a peak within ± 0.25 minutes of the RT. The analyst confirms that the branched isomers present in the quantitative calibration standards for PFOS, PFOA, PFHxS, PFNA, Me-FOSE, Et-FOSE, FOSA, Me-FOSA, Et-FOSA, Et-FOSAA and Me-FOSAA are within the ± 0.25 minute window. If they are not, an adjustment to the RT window is made. The analyst confirms the presence of the branched isomers in the technical (qualitative) standard as well, and adjusts the RT window for an analyte if it is not present within the ± 0.25 minute window.

12.4.5.1. If a peak is detected within this window of ±0.25 minutes, Chrom will assign the absolute retention time at the apex of the peak. Chrom assigns the RT to the most predominant peak within this window. As the linear peak is the predominant peak in calibration solutions for those PFAS that are calibrated with the combination of both branched and linear isomers, those PFAS require additional evaluation in the event that the branched isomer is the predominant peak in a field sample and Chrom has not positively identified the peak due to the RT shift, as the apex may now be the branched isomer.

12.4.5.2. Additional evaluation is required if the field samples contain branched isomers not present in the quantitative or qualitative standards. The analyst confirms that only the peaks present in the calibration standards are included in the peak integration, or adjusts the peak integration to assure that only the peaks present in the standards are identified and quantitated.

12.4.5.3. RT are updated as needed based upon evaluation of the daily CCV.

12.4.6. The signal to noise ratio for both quantitative and qualitative ions/transitions must be ≥ 3:1 or >10:1 if the analyte only has a single transition for a baseline deflection to be considered a peak. If this criterion is not met, the analyte is not considered and reported as "non-detect".

12.5. The ICAL established in Section 10 is used to calculate concentrations for the extracts.

12.6. Extract concentrations are calculated as below. The first equation applies Average Response Factor model, the second to a linear fit, and the third to the quadratic line fit.

$$Concentration\ (ng/mL) = \frac{y}{RRF}$$

Equation 4

$$Concentration\ (ng/mL) = \frac{y-c}{b}$$

Equation 5

$$Concentration\ (ng/mL) = \frac{-b \pm \sqrt{b^2-4ac-y}}{2a}$$

Equation 6

Where:

y = $\frac{Area_{Target}}{Area_{IDA}} \times Concentration(IDA)$

RRF = Relative Response Factor

x = concentration

a = curvature

b = slope

c = intercept

12.7. Water Sample Result Calculation:

$$Concentration\ (ng/L) = \frac{C_{ex}V_t}{V_o}$$

Equation 7

Where:

C_{ex} = Concentration measured in sample extract (ng/mL)

V_t = Volume of total extract (mL)

V_o = Volume of water extracted (L), i.e. total volume fortified with IDA

12.8. Soil Sample Result Calculation:

$$Concentration\ (ng/g) = \frac{C_{ex}V_t}{W_sD}$$

Equation 8

Where ng/g = mg/kg and:

C_{ex} = Concentration measured in sample extract (ng/mL)

V_t = Volume of total extract (mL)

W_s = Weight of sample extracted (g)

D = Fraction of dry solids, which is calculated as follows:

$\frac{100-\%\ moisture\ in\ sample}{100}$ (for dry weight result)

12.9. IDA Recovery Calculation:

$$\%\ Recovery = \frac{A_{IDA}Q_{IS}}{A_{IS}Q_{IDA}RRF_{IDA}} \times 100$$

Equation 9

Where:

RRF_{IDA} = Response Factor for IDA compound

A_{IDA} = Area response for IDA compound

A_{IS} = Area Response for IS compound

Q_{IS} = Amount of IS added

Q_{IDA} = Amount of IDA added

12.10. Raw data, calibration summaries, QC data, and sample results are reviewed by the analyst. These must also be reviewed thoroughly by a second qualified person. See the Data Review Policy (*SAC-QA-P-QP71754*). These reviews are documented in TALS.

13) Method Performance

13.1. The group/team leader has the responsibility to ensure that this procedure is performed by an associate who has been properly trained in its use and has the required expertise.

13.2. Method Detection Limit
The laboratory must generate a valid method detection limit for each analyte of interest. The MDL must be below the reporting limit for each analyte. The procedure for determination of the method detection limit is given in 40 CFR Part 136, Appendix B, and further defined in SOP *QA-SOP71736* and policy *SAC-QA-P-QP71748*. MDLs are available in the Quality Assurance Department.

13.2.1. As MDL studies are run on clean laboratory matrices, statistically derived MDL values could be artificially lower than achievable limits in real world samples. Nominal MDL values, set at no lower than ¼ the calculated and verified Reporting Limit (or Limit of Quantitation) will be used as a method to avoid artificially low bias in MDL studies.

13.3. Initial Demonstration of Capability (IDOC)

13.3.1. The method initial demonstration of capability is performed by processing 4 LCS samples and a method blank. Compare the average recovery and RSD to the IPR limits in Table 5 for aqueous samples and Table 7 for solid, biosolids and tissue samples of the reference method.

13.3.2. Each analyst performing this procedure must successfully analyze four LCS QC samples and compare the average recovery and RSD to the IPR limits in Table 5 for aqueous samples and Table 7 for solid, biosolids and tissue samples of the reference method. While there are no mean or RSD requirements for IDA, recoveries for each IDA must be within the specified limits. IDOCs are approved by the Quality Assurance Manager and the Technical Director. IDOC records are maintained by the QA staff in the central training files.

14) Pollution Control

14.1. All waste will be disposed of in accordance with Federal, State and Local regulations.

14.2. Solid phase extraction used for water samples greatly reduces the amount of solvent used compared to liquid-liquid extraction.

14.3. Standards and reagents are purchased and prepared in volumes consistent with laboratory use to minimize the volume of expired standards and reagents requiring disposal.

14.4. Where reasonably feasible, technological changes have been implemented to minimize the potential for pollution of the environment. Employees will abide by this method and the policies in Section 13 of the HSE Manual (*NDSC-US EHS-QP46060*) for "Waste Management and Pollution Prevention."

14.5. Do not allow waste solvent to vent into the hoods. All solvent waste is stored in capped containers unless waste is being transferred.

14.6. Transfer waste solvent from collection cups (tri-pour and similar containers) to jugs and/or carboys as quickly as possible to minimize evaporation.

15) Waste Management

The following waste streams are produced when this method is carried out:

15.1. Assorted test tubes, autovials, syringes, filter discs and cartridges. Dump the dry solid waste into a yellow contaminated lab trash bucket. When the bucket is full or after no more than one year, whichever comes first, tie the plastic bag liner shut and put the lab trash into the hazardous waste – landfill steel collection drum in the H3 closet. When the drum is full or after no more than 75 days, whichever comes first, move it to the waste collection area for shipment.

15.2. Extracted soil samples, used sodium sulfate, paper funnel filters, glass wool, thimbles, and extracted solids saturated with solvents. Dump these materials into an orange contaminated lab trash bucket. When the bucket is full or after no more than one year, whichever comes first, tie the plastic bag liner shut and put the lab trash into the incineration steel collection drum in the H3 closet. When the drum is full or after no more than 75 days, whichever comes first, move it to the waste collection area for shipment.

15.3. Waste Methanol. Collect the waste solvents in tripours during use. Empty the tripours into a 1-liter to 4-liter carboy at the fume hood. When the carboy is full, or at the end of your shift, whichever comes first, empty the carboy into the steel flammable solvent drum in the H3 closet. When the drum is full to between four and six inches of the top, or after no more than 75 days, whichever comes first, move the steel flammable solvent drum to the waste collection area for shipment.

15.4. Mixed water/methanol waste from soil extraction. Collect the waste in the HPLC waste carboy. When full, or after no more than one year, whichever comes first, dump into the blue plastic HPLC collection drum in the H3 closet. When the drum is full to between four and six inches of the top or after no more than 75 days, whichever comes first, move it to the waste collection area for shipment.

15.5. Aqueous acidic waste from the LCMS instrument contaminated with methanol. This is collected in a 1-gallon carboy at the instrument. When the carboy is full, or after no more than one year, whichever comes first, it is emptied into the blue plastic HPLC collection drum in the H3 closet. When the drum is full to between four and six inches of the top or after no more than 75 days, whichever comes first, move it to the waste collection area for shipment.

15.6. Autovials contaminated with methanol. As the autovials are removed from the instrument after analysis, they are collected in open containers at the instrument. After all autovials are removed, the open container must be dumped into a closed satellite collection container in a fume hood, as the punctured septa in the autovial can allow methanol and other contaminants to evaporate into the atmosphere. The satellite collection containers are transferred to the waste disposal area when full or after no more than one year, whichever comes first, where they are disposed through the vial eater or by consolidation into a 30- to 55-gallon open top plastic drum, which is shipped after no more than 90 days.

16) Method Modifications

16.1. Modifications from Method 1633 are detailed below:

16.1.1. Water samples are extracted at 125 mL. Soil samples are extracted at 2 g. Tissue sample extract final volume is 10 mL.

16.1.2. The SPE column incorporates 10 mg graphitized carbon. Column washing and elution procedures are modified accordingly. Loose carbon is no longer used.

16.1.3. The calibration scheme has been updated to align with the current Eurofins LC/MS instrumentation and sensitivity.

16.1.4. Additional analytes have been added.

16.1.5. The analytical column, while still C18 based, has been changed.

16.1.6. Extraction solvents have been updated to improve method performance.

16.1.7. The solid extraction procedure was updated to improve method performance.

16.1.8. The CCVL (ISC) will be used to start the analytical sequence on non-ICAL days and is to meet both S/N (3:1 and 10:1 as required) and CCV acceptance criteria.

16.1.9. IDA corrective action/acceptability logic elucidated. See Section 9.11.2.

16.1.10. Mass Transition Ion Ratio corrective action/acceptability logic elucidated. See Section 9.12 (2X rule).

16.1.11. Immediately following the loading of aqueous samples onto the SPE columns, sample bottles are rinsed with reagent water, and the reagent water added to the column reservoir. This step is addition to the basic methanol rinse as part of the SPE elution step.

16.1.12. The mass transition for 13C4-PFOA is 417 > 372, not 417 > 172 as listed in the reference method. Signal strength is much stronger using this transition set.

17) Appendices

17.1. Table 17.1, Water IDA Limits. See the reference method for IDA limits for leachates, soil/sediment, tissue and biosolids.

TABLE 17.1 Water IDA Limits		
IDA	Lower Limit	Upper Limit
13C4 PFBA	5	130 *
13C PFPeA	40	130
13C PFHxA	40	130
13C PFHpA	40	130
13C PFOA	40	130
13C PFNA	40	130
13C PFDA	40	130
13C PFUnA	30	130
13C PFDoA	10	130
13C PFTeDA	10	130
13C PFBS	40	135
13C PFHxS	40	130
13C PFOS	40	130
13C PFOSA	40	130
d3 NEtFOSA	10	130
d5 NMeFOSA	10	130
d9 NEtFOSE	10	130
d7 NMeFOSE	10	130
d5 NEtFOSAA	25	135
d3 NMeFOSAA	40	170
13C 4:2 FTS	40	200
13C 6:2 FTS	40	200
13C 8:2 FTS	40	300
13C HFPO-DA	40	130

* Recovery of $^{13}C_4$-PFBA can be problematic in some field samples. Although the lower limit for recovery for this EIS is set below 10%, laboratories should routinely track recovery of this EIS and take reasonable steps to ensure that recovery is at least 10% in the majority of samples

QA-SOP70881 Nonconformance and Corrective Action System
QA-SOP71736 Detection and Quantitation Limits (Addendum to CA-Q-S-006) [Quality Assurance Procedure]
NDSC-US-EHS-QP46060 Environmental Health and Safety (HSE) Manual
NDSC-US-TS-QP44940 Calibration Curves and the Selection of Calibration Points
SAC-QA-P-QP71748 Quality Control Program
SAC-QA-P-QP71754 Technical Data Review Requirements

SAC-QA-SOP71665 Standards and Reagents and Quality Control Check Procedures [Quality Assurance Procedure]
SAC-T-OP-SOP70329 Cleaning of Glassware (Organics)

End of document

Version history

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