

**Quality Assurance Project Plan
Saint-Gobain Performance Plastics Sites**

**14 McCaffrey Street (Site No. 442046) and
1 Liberty Street (Site No. 442048)**

**Village of Hoosick Falls
Rensselaer County, New York**

Prepared for:

Saint-Gobain Performance Plastics

Prepared By:

C.T. Male Associates



50 Century Hill Drive
Latham, NY 12110

BEC Engineering and Geology, P.C.



4300 MarketPointe Drive
Minneapolis, MN 55435

Revision 1
March 6, 2020

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Acronym List

ARARs – Applicable or relevant and appropriate requirements
COC – Chain-of-custody
DER – Division of Environmental Remediation
DQO – Data quality objective
DUSR – Data Usability Summary Report
EPA – Environmental Protection Agency
FSP – Field Sampling Plan
HASP – Health & Safety Plan
HDPE – High Density Polyethylene
LCS – Laboratory control sample
MDL – Method detection limit
MS – Matrix spike
MSD – Matrix spike duplicate
NYSDEC – New York State Department of Environmental Conservation
PARCCS – Precision, accuracy, representativeness, completeness, comparability, and sensitivity
PFAS – Per-and polyfluoroalkyl substances

<u>Name</u>	<u>Acronym</u>	<u>CAS Number</u>
6:2-Fluorotelomersulfonic acid	6:2 FTS	27619-97-2
8:2-Fluorotelomersulfonic acid	8:2 FTS	39108-34-4
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoDA	307-55-1
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonamide	PFOSA	754-91-6
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorotetradecanoic acid	PFTeDA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnDA	2058-94-8

21 individual PFAS listed above are in accordance with the most recent NYSDEC guidance (NYSDEC, 2019).

QA – Quality assurance
QAM – Quality Assurance Manual
QAPP – Quality Assurance Project Plan
QC – Quality control
RPD – Relative percent difference
RL – Reporting limit
SOP – Standard operating procedure
SPE – Solid phase extraction
SPLP – Synthetic Precipitation Leaching Procedure
TAL – Target Analyte List
TCL – Target Compound List
TOC – Total organic carbon
UFP – Uniform Federal Policy
VOA – Volatile organic analysis
VOC – Volatile organic compound
WAX – Weak ion exchange

Introduction

This Quality Assurance Project Plan (QAPP) has been prepared for the continuation of Remedial Investigation (RI) and Feasibility Study (FS) activities at the Saint-Gobain Performance Plastics Corporation (Saint-Gobain) Sites ("the Sites") located at 14 McCaffrey Street and 1 Liberty Street in the Village of Hoosick Falls, Rensselaer County, New York. A QAPP was prepared for each of the Sites in conjunction with their RI/FS Work Plans as prepared by C.T. Male Associates (C.T. Male, 2016a; C.T. Male, 2016b). A description of the Sites, background information and objectives are presented in detail in these and subsequent work plans and reports. In addition to RI/FS activities associated with the Sites, regional investigations conducted by C.T. Male Associates Engineering, Surveying, Architecture, Landscape Architecture & Geology, DPC (C.T. Male) and/or BEC Engineering and Geology, P.C (BEC), such as the Regional Air Deposition Study being performed in the Town of Hoosick located in Rensselaer County, New York, may also reference and rely on this QAPP as appropriate.

This QAPP provides the details of the organizations and the project management, objectives, data acquisition, data assessment, oversight, and data review procedures associated with the project conducted on and off the site. Protocols for sample collection, handling, storage, chain-of-custody (COC), laboratory and/or field analyses, data evaluation and validation, and reporting are addressed. Since multiple investigations and routine monitoring activities may utilize this QAPP, some project details will be included in the site-specific work plans. Field activities conducted under this QAPP will be conducted in accordance with the applicable Field Sampling Plan (FSP) and the site-specific Health & Safety Plan (HASP).

The QAPP has been prepared in a manner consistent with the following guidance documents:

- DER-10 Technical Guidance For Site Investigation and Remediation, New York State Department of Environmental Conservation (NYSDEC), May 2010;
- 6 NYCRR Part 375, Environmental Remediation Programs, Subparts 375-1 to 375-4 and 375-6, Effective December 14, 2006;
- Data Quality Objectives for Remedial Response Activities: Development Process, EPA/540/G-87/003, USEPA, March 1987;
- United States Environmental Protection Agency (EPA) Intergovernmental Data Quality Task Force environmental requirements as specified in the Uniform Federal Policy (UFP) QAPP guidance document Part 2A Revised (March 2012);
- EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5; and
- EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5.

QAPP Worksheet #1 & 2 – Title and Approval Page

1. Project Identifying Information

- a. **Site name/project name:** Saint-Gobain Performance Plastics Sites located at 14 McCaffrey Street (McCaffrey Street Site) and 1 Liberty Street (Liberty Street Site), in Hoosick Falls, New York
- b. **Site location/number:** Hoosick Falls / NYSDEC Site No. 442046 and Site No. 442048

2. Lead Organization

- a. **Lead Organization:** Saint-Gobain Performance Plastics
 - i. **Project Manager (name/title/signature/date):**

Christopher Angier, Sr. Environmental Engineer Date

- 3. **State Regulatory Agency:** New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER),

- i. **Project Manager (name/title/signature/date):**

Ian Beilby, P.E., Project Manager, Section C, Remedial Date
Bureau B

4. Other Stakeholders (as needed)

- a. **Consulting Engineers:** C.T. Male Associates (C.T. Male)

- i. **Project Principal (name/title/signature/date):**

 3/6/2020

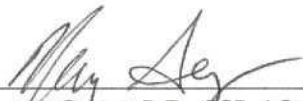
Daniel Reilly, P.E. / Environmental Services Manager Date

- ii. **Project Manager (name/title/signature/date):**

 3/6/2020

Kirk Moline, P.G. (NY) / Project Manager Date

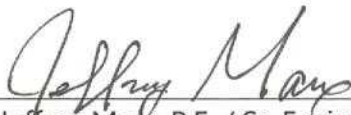
iii. Health & Safety Manager (name/title/signature/date):


Nancy Garry, P.E., CSP / Sr. Environmental Engineer 3/6/20
Date

iv. Field Services Manager (name/title/signature/date):


Jonathan Dipport, P.G. / Geologist 3/6/20
Date

v. Quality Assurance (QA) Manager (name/title/signature/date):


Jeffrey Marx, P.E. / Sr. Environmental Engineer 3/6/2020
Date

b. Consulting Engineers: BEC Engineering and Geology, P.C. (BEC)**i. Project Principal (name/title/signature/date):**


Brian Angerman, P.E. / Sr. Environmental Engineer 03/06/20
Date

ii. Project Manager (name/title/signature/date):


Sara Ramsden, Sr. Environmental Consultant 03/06/20
Date

iii. Quality Assurance (QA) Manager (name/title/signature/date):


Terri Olson, Sr. Data Quality Specialist 03/06/20
Date

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

14 McCaffrey Street

- *Final Remedial Investigation/Feasibility Study Work Plan. Saint-Gobain Performance Plastics, McCaffrey Street Site 14 McCaffrey Street. Village of Hoosick Falls, Rensselaer County. DEC Site No.: 442046, prepared by C.T. Male, revision August 30, 2016.*
- *Supplemental Scope of Work: Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated May 12, 2017.*
- *Data Summary Report: Saint-Gobain McCaffrey Street Site, DEC Site No. 442046, 14 McCaffrey Street, Hoosick Falls, Rensselaer County, prepared by C.T. Male, dated June 09, 2017.*
- *Supplemental Scope of Work: GenX Sampling and Analysis, Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated January 12, 2018.*
- *Data Summary Submittal (Through 2017), Saint-Gobain Performance Plastics, McCaffrey Street Site, 14 McCaffrey Street, Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated May 07, 2018.*
- *Modification to Groundwater Sampling Method, Saint-Gobain Performance Plastics McCaffrey and Liberty Street Sites, Village of Hoosick Falls, Rensselaer County, New York., prepared by C.T. Male, dated August 28, 2018.*
- *Supplemental Scope of Work, Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated August 29, 2018.*
- *Interim Remedial Measure Work Plan Groundwater Capture and Treatment. Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated April 3, 2019.*
- *Reduction of Groundwater Analytical Parameters and Sampling Frequency. Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated May 17, 2019.*
- *Data Summary Submittal (January Through December 2018), Saint-Gobain Performance Plastics, McCaffrey Street Site, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046, prepared by C.T. Male, dated August, 01, 2019.*

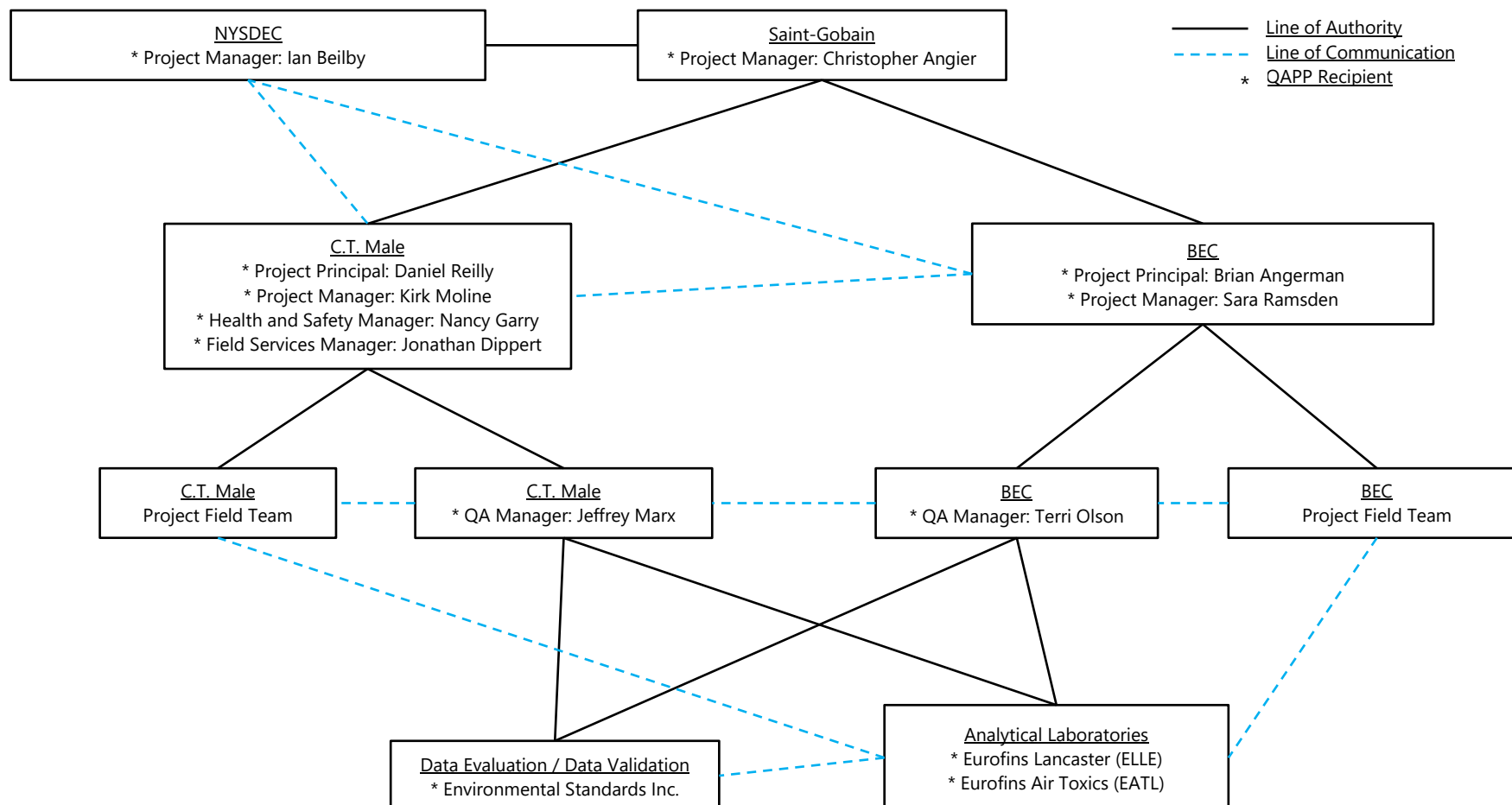
1 Liberty Street

- *Final Draft Site Characterization Work Plan. Saint-Gobain Performance Plastics Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male, revision dated July 15, 2016.*
- *Supplemental Investigations. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male, dated November 29, 2016.*
- *Liberty Street Site Characterization-Supplemental Investigation. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male, dated April 26, 2017.*

- *Supplemental Scope of Work. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male, dated May 19, 2017.*
- *Drum Removal and Exploratory Test Pitting Plan-Final. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male, dated November 7, 2017.*
- *Data Summary Submittal (Through February 2018), Saint-Gobain Performance Plastics, Liberty Street Site, 14 McCaffrey Street, Hoosick Falls, Rensselaer County, DEC Site No. 442048, prepared by C.T. Male, dated May, 25, 2018.*
- *Modification to Groundwater Sampling Method, Saint-Gobain Performance Plastics McCaffrey and Liberty Street Sites, Village of Hoosick Falls, Rensselaer County, New York., prepared by C.T. Male, dated August 28, 2018.*
- *Supplemental Scope of Work, Saint-Gobain Performance Plastics Liberty Street Site, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, New York, prepared by C.T. Male, date September 27, 2018.*
- *Reduction of Groundwater Analytical Parameters and Sampling Frequency. Saint-Gobain Performance Plastics, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442048, prepared by C.T. Male, dated May 15, 2019.*
- *Pre-Design Investigation Work Plan and IRM Concept. Saint-Gobain Performance Plastics, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442048, prepared by C.T. Male, dated May 15, 2019.*
- *Data Summary Submittal (March Through December 2018), Saint-Gobain Performance Plastics, McCaffrey Street Site, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442048, prepared by C.T. Male, dated August, 01, 2019.*

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

This section identifies the reporting relationships between organizations involved in the project, including the lead organization and contractors and subcontractor organizations. It also includes recipients of controlled copies of the QAPP. Contractors and subcontractors shown on this chart are responsible for document control within their organizations. Site-specific work plans may identify other personnel in similar roles. Email addresses and phone numbers for individuals listed below are provided in QAPP Worksheet #6.



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

This section identifies project personnel associated with each organization, contractor, and subcontractor participating in responsible roles. This includes the project manager, QA Manager, project contacts for organizations involved in the project, the project health & safety manager, field operation personnel, and the analytical services provider. This worksheet also lists individuals' project titles or roles; qualifications; and any specialized/non-routine training, certifications, or clearances required by the project. Signatures indicate personnel have read and agree to implement this QAPP as written and that the QAPP will be kept on-file at each organization.

ORGANIZATION: C.T. Male Associates (C.T. Male)

Name	Title/Role	Education/Experience	Specialized Training/ Certifications	Signature/Date
Daniel Reilly	Project Principal	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2
Kirk Moline	Project Manager	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2
Nancy Garry	Health & Safety Manager	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2
Jonathan Dippert	Field Services Manager	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2
Jeffrey Marx	QA Manager	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2

ORGANIZATION: BEC Engineering and Geology, P.C. (BEC)

Name	Title/Role	Education/Experience	Specialized Training/ Certifications	Signature/Date
Brian Angerman	Project Principal	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2
Sara Ramsden	Project Manager, Health & Safety Manager	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2
Terri Olson	QA Manager	See resumé included in Attachment A.	See resumé included in Attachment A.	See Worksheet #1 & 2

ORGANIZATION: Eurofins Lancaster Laboratories Environmental, LLC of Lancaster, Pennsylvania (ELLE)

Name	Title/Role	Specialized Training/ Certifications	Signature/Date
Kerri Sachtleben	Project Manager	Training as required by laboratory QA Manual	 9/25/19
Dorothy Love	QA Manager	Training as required by laboratory QA Manual	9/25/19 

ORGANIZATION: Eurofins Air Toxics, LLC of Folsom, California (EATL)

Name	Title/Role	Specialized Training/ Certifications	Signature/Date
Brian Whittaker	Project Manager	Training as required by laboratory QA Manual	Brian Whittaker 9/26/19
Melanie Levesque	QA Manager	Training as required by laboratory QA Manual	 09/26/19

QAPP Worksheet #6 – Communication Pathways

Communication pathways for this project are shown below.

Communication Driver	Organization	Name	Contact Information	Procedure (Timing, pathway, etc.)
Regulatory Agency Interface	NYSDEC	Ian Beilby	Office (O): 518-402-9676 ian.beilby@dec.ny.gov	C.T. Male or BEC will contact Saint-Gobain and the regulatory agency (NYSDEC) via email if issues with the implementation of this QAPP occur impacting data quality, when comments to the submittals occur, and when new field sampling plans are identified for implementation.
	C.T. Male	Kirk Moline	O: 518-786-7502 k.moline@ctmale.com	
	BEC	Brian Angerman	O: 952-832-2927 bangerman@bec-mn.com	
	Saint-Gobain	Christopher Angier	O: 518-686-6268 Christopher.Angier@saint-gobain.com	
Laboratory Problems / Corrective Actions	C.T. Male	Jeffrey Marx	O: 518-786-7548 j.marx@ctmale.com	C.T. Male or BEC QA Manager will be the contact for the laboratories should the laboratories experience issues with project samples. Environmental Standards will contact the laboratories if issues are discovered from data validation.
	BEC	Terri Olson	O: 952-842-3578 tolson@bec-mn.com	
	Environmental Standards	David Blye	O: 610-935-5577 DBlye@envstd.com	
	ELLE	Kerri Sachtleben	O: 717-556-7376 KerriSachtleben@eurofinsUS.com	
	EATL	Brian Whittaker	O: 916-605-3355 BrianWhittaker@eurofinsUS.com	
Safety Issues	C.T. Male	Jonathan Dippert	O: 518-786-7563 j.dippert@ctmale.com	C.T. Male field staff will contact the C.T. Male Field Services Manager and/or Health & Safety Manager and BEC field staff will contact the BEC Project Manager. Work may stop until safety issues are cleared. NYSDEC may be contacted if safety issues delay obtaining/reporting of data.
		Nancy Garry	O: 518-786-7541 n.garry@ctmale.com	
	BEC	Sara Ramsden	O: 952-832-2877 sramsden@bec-mn.com	

Communication Driver	Organization	Name	Contact Information	Procedure (Timing, pathway, etc.)
Field Problems / Corrective Actions	C.T. Male	Kirk Moline	O: 518-786-7502 k.moline@ctmale.com	C.T. Male field staff will contact the C.T. Male Project Manager and/or Field Services Manager and BEC field staff will contact the BEC Project Manager, to discuss difficulties encountered during field activities. They will coordinate with their office's QA Manager, as needed and appropriate. C.T. Male or BEC will contact the regulatory agency (NYSDEC) via email.
		Jonathan Dippert	O: 518-786-7563 j.dippert@ctmale.com	
	BEC	Sara Ramsden	O: 952-832-2877 sramsden@bec-mn.com	
	NYSDEC	Ian Beilby	Office (O): 518-402-9676 ian.beilby@dec.ny.gov	
Field Activity Modifications	NYSDEC	Ian Beilby	O: 518-402-9676 ian.beilby@dec.ny.gov	Saint-Gobain, C.T. Male, and BEC will propose modifications to current sampling program via periodic updates or otherwise as needed. Reduction of testing parameters or frequencies will be performed in consultation with and approval from NYSDEC.
	C.T. Male	Kirk Moline	O: 518-786-7502 k.moline@ctmale.com	
		Jonathan Dippert	O: 518-786-7563 j.dippert@ctmale.com	
	BEC	Sara Ramsden	O: 952-832-2877 sramsden@bec-mn.com	
	Saint-Gobain	Christopher Angier	O: 518-686-6268 Christopher.Angier@saint-gobain.com	

Other Contact Information for Personnel Listed in Organizational Chart

Organization	Name	Contact Information
C.T. Male	Daniel Reilly	O: 518-786-7625 d.reilly@ctmale.com

QAPP Worksheet #9 – Project Scoping Session Participants Sheet

Investigation activities at or in the vicinity of the Sites are ongoing and are anticipated to evolve over time as additional data are collected. The sampling and analysis activities implemented as part of additional investigations or routine monitoring activities will follow the protocols set forth in this QAPP and in accordance with approved scopes of work (SOWs) or similar plans. Additionally, this QAPP may be updated as needed based on the planned sampling and analysis activities.

QAPP Worksheet #10 – Conceptual Site Model

Information relating to each of the Sites can be found in existing work plans, SOWs and reports as listed at the end of Worksheets #1 and #2 of this QAPP. The conceptual site models will be updated and documented in the RI Reports for each of the Sites.

QAPP Worksheet #11 – Project/Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements that clearly state the objective of a proposed project, define the most appropriate type of data to collect, determine the appropriate conditions for data collection, and specify acceptable decision error limits that establish the quantity and quality of data needed for decision making.

DQOs for measurements during this project will be addressed in terms of the data quality indicators: precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). The numerical PARCCS parameters will be determined from the project DQOs to confirm that they are met. The DQOs and resulting PARCCS parameters, summarized in Worksheet #12, will require that the sampling be performed using standard methods with properly operated and calibrated equipment, and be conducted by trained personnel.

The laboratories performing the analytical services are detailed in Table 1, which includes their addresses and the list of parameters that each lab may perform. Other laboratories may need to perform analyses if a laboratory has an unplanned event such as an instrument breakdown. The parameter would be analyzed by a subcontract laboratory that has accreditation in NY for the same method, where applicable. If possible, the subcontract laboratory would have similar limits as the primary laboratory. Any subcontracting of analyses will be approved by C.T. Male and/or BEC prior to sample submittal.

Parameters other than PFAS that may be analyzed to evaluate the environmental quality of the site's media may include the Target Compound List (TCL) of volatile organic compounds (VOCs), the Target Analyte List (TAL) of metals, (including mercury and the major cations [Ca, Mg, Na and K]), and total organic carbon (TOC) (C.T. Male, 2019a; C.T. Male 2019b).

The sample type, laboratory analysis, sampling method and sampling rationale for the samples collected during the site investigations and routing monitoring is summarized in the site-specific work plans or SOWs.

QAPP Worksheet #12 – Measurement Performance Criteria Table

This worksheet displays the data quality indicator, quality control (QC) activity, matrix group, and measurement performance criteria for both the sampling and analytical measurement systems. Matrix groups may include but are not limited to the following:

- Water – groundwater, surface water (does not include drinking water)
- Solid – soil, sediment
- Air – soil vapor, indoor air, outdoor air

Data Quality Indicator*	QC sample or measurement performance activity	Matrix Group	Measurement Performance Criteria
Precision (field)	Field duplicate samples	Water, solid	Values > 5x reporting limit (RL)/limit of quantitation (LOQ); relative percent difference (RPD) ≤ 30%
Precision (laboratory)	Laboratory duplicate samples or Laboratory control samples (LCS) and LCS duplicates	Water, solid, air	Values > RL/LOQ; method-specific (See Table 2)
Overall accuracy/bias (field and laboratory)/representativeness	Field, equipment, rinsate (rinse) blanks	Water and solid	No target analyte concentrations ≥ RL/LOQ
	Laboratory Trip blanks	Water (VOCs and PFAS)	
Overall accuracy/bias (laboratory)	Method blanks	Water, solid, air	No target analyte concentrations ≥ RL/LOQ
Analytical accuracy/bias/precision (laboratory)	LCS and LCS duplicates	Water, solid, air	Analyte-specific (See Table 2)
Analytical accuracy/bias/precision (laboratory)	Matrix spike (MS) and Matrix spike duplicate (MSD) samples	Water, solid	Analyte-specific (See Table 2)
Analytical accuracy/bias (laboratory)	Surrogate recoveries	Water, solid	Analyte-specific (See Table 2)
Sensitivity	Samples reported to method detection limit (MDL) (where applicable)	Water, solid, air	Analyte-specific (See Table 2)
Completeness	See Worksheet #34	Water, solid, air	See Worksheet #34

* Laboratory QC is performed as required by the method

QAPP Worksheet #13 – Secondary Data Uses and Limitations Table

Analytical data to be used for this project prior to this QAPP, was collected in accordance with previous QAPPs and work plans as identified in Worksheets #1 and #2 of this QAPP.

QAPP Worksheet #14 & 16 – Project Tasks & Schedule Table

Listed are the project activities as well as the QA assessments that will be performed during the course of the project.

Activities	Organization	Dates		Deliverable(s)	Anticipated Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Well drilling, installing, and hydraulic testing	C. T. Male, BEC	QAPP effective date/as needed based on site-specific plans	Ongoing	Field reports and sample results	Ongoing
Collecting water, solid, air, and field QC samples	C. T. Male, BEC	QAPP effective date/as needed based on site-specific plans	Ongoing	Field reports and sample results	Ongoing
Laboratory analyses	ELLE, EATL	Upon receipt of samples	Ongoing	Laboratory reports (Category B Data Package)	Ongoing
Data evaluation / validation	Environmental Standards	After receipt of data reports	Ongoing	Evaluation or validation report entitled 'Data Usability Summary Report (DUSR)'	Ongoing
Summarizing data	C. T. Male, BEC	After receipt of data reports	Ongoing	Telephone, email, progress reports	Ongoing
Site investigation / monitoring progress report	C. T. Male, BEC	After receipt and review of relevant data reports	Ongoing	Notification to NYSDEC	Ongoing

QAPP Worksheet #15 – Project Action Limits and Laboratory-Specific Detection/Quantitation Limits

Analytical data quality objectives are used to confirm that the analysis will accurately and adequately identify the contaminants of concern. The applicable or relevant and appropriate requirements (ARARs) are related to defining satisfactory cleanup efforts. To be able to evaluate the data generated with respect to potential ARARs, the samples will be reported to the MDL (where applicable). The analytical methods selected for this project are designed to achieve ARAR values. The laboratory limits for specific parameters are included in Table 2.

QAPP Worksheet #17 – Sampling Design and Rationale

The design and rationale of the sampling program will be specified in the site-specific work plans.

QAPP Worksheet #18 – Sampling Locations and Methods

The site-specific work plans and the current FSP will provide specific detail regarding the individual sample locations and methods, respectively.

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

Sample Parameters, Matrix, Containers, Preservation, Hold Times per Analytical Group

Analytical Group	Matrix	Containers (number, size & type per sample) ⁽¹⁾	Preservation ⁽²⁾	Preparation/ Analytical Holding Time ⁽³⁾
PFAS	Water	250 mL high density polyethylene (HDPE)	Cool ≤6°C, Trizma (if chlorine residual present)	14 days until extraction; analysis within 28 days of extraction
	Solid	4.5 oz HDPE jar	Cool ≤6°C	14 days until extraction; analysis within 40 days of extraction
PFAS, SPLP	Solid	4.5 oz HDPE jar	Cool ≤6°C	28 days until leachate or extraction; analysis within 28 days of extraction Note that these holding times may be subject to change based on most current NYSDEC technical guidance.
TCL VOCs	Water	3-40 mL glass volatile organic analysis (VOA) vials	HCl to pH<2, cool ≤6°C, no headspace	14 days (acid preserved), 7 days (unpreserved)
	Solid	Coring device kit (1 methanol and 2 low-level vials w/DI water)	1:1 solvent or zero headspace, cool ≤6°C. Additional unpreserved for %moisture if solvent collection	14 days (methanol), 48 hours from sample collection to analysis or freezing (DI water)
TAL Metals (except mercury)	Water	250 mL plastic	pH <2 HNO ₃	6 months
	Solid	4 oz. glass jar	Cool ≤6°C	6 months
Mercury	Water	250 mL plastic	pH <2 HNO ₃	28 days
	Solid	4 oz. glass jar	Cool ≤6°C	28 days
TOC	Solid	4 oz. glass jar	Cool ≤6°C	28 days
pH	Solid	4 oz. glass jar	Cool ≤6°C	As soon as possible
Moisture, %	Solid	4 oz. glass jar	Cool ≤6°C	Not applicable
TO-15	Air	Evacuated, certified clean canisters	NA	30 days

(1) Container types and sizes listed are for guidance only. Laboratory may use different containers or combine analyses into larger volume containers.

(2) Cool ≤ 6 °C will be chilled using regular ice only.

(3) Holding time starts from date of collection unless otherwise noted.

Note: Laboratory standard operating procedures (SOPs) are retained at the place of business and are available upon request for review.

QAPP Worksheet #20 – Field Quality Control Summary

The site-specific work plans and FSP may provide additional detail on the sample type, parameter, frequency, and sampling methods of field QC samples. At a minimum, the following field quality control samples will be collected. See BEC's SOP 'Collection of Quality Control Samples' for further definitions.

Matrix	Analytical Group	No. of Field Duplicate Pairs	No. of MS/MSD	No. of Laboratory Trip Blanks	No. of Field Trip Blanks	No. of Equipment Blanks	No. of Rinsate (Rinse) Blanks or Material Checks
Water, solid	All analytical groups	5% of total number sampled or one sample per media, whichever is greater	5% of total number sampled per media	One per cooler for VOC and PFAS	One per cooler for PFAS	5% of total number sampled per media or at a minimum of one per day per matrix when decontamination of sampling equipment has occurred.	One per lot/batch of new equipment/material

QAPP Worksheet #21 – Project Sampling SOP References

The field activities for this site will include collecting samples of water, solid, and air matrix groups (see Worksheet #12) for laboratory analysis. The procedures relative to implementing these field activities are included in the FSP. As described in the FSP and SOPs, specific precautions will be implemented when sampling for PFAS compounds to prevent cross contamination.

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

The field equipment calibration, maintenance, testing, and inspection information are included in the FSP.

QAPP Worksheet #23 – Analytical and Validation SOPs

The laboratories' SOPs and the data validation SOPs are retained at each place of business and are available upon request for review once each laboratory's specific protocols have been followed. Modifications to methods performed are summarized below.

ELLE - EPA 537 modifications for non-drinking water matrices.

- No Trizma preservation of non-drinking water samples.
- Weak anion exchange (WAX) solid phase extraction (SPE) column used for the effective extraction of the broader range of compounds instead of the SPE specified in EPA 537.
- Isotopically labelled analogs used as pre-extraction internal standards (isotope dilution) instead of the EPA 537 specified post-extraction addition of internal standards for the analysis of matrices that are not finished drinking waters (i.e., surface water, groundwater, wastewater and leachates) to correct results based on extraction efficiency.
- Alternate solvent used for extraction.
- Extracts are not concentrated to dryness.
- Internal standards added post-extraction to calculate the recoveries of the isotopic analogs listed above.
- More PFAS analyzed than the EPA 537 list of compounds.
- Laboratory control sample (LCS) concentration not rotated as listed in EPA 537.
- RPD not controlled between the high and low areas for each internal standards in the initial calibration as listed in EPA 537.
- Holding time of 40 days from extraction to analysis used for solid matrices. EPA 537 only addresses holding times for drinking water samples.

EATL – TO-15 Low-level and SIM modifications

- < 30% RSD is allowed for 4 compounds instead of 2 compounds as listed in TO-15.
- UHP Nitrogen is used for blanks and standards instead of Zero Air since it provides a higher purity gas matrix.

QAPP Worksheet #24 – Analytical Instrument Calibration

The analytical instrument calibration information is included in each laboratories' Quality Assurance Manual (QAM) and/or the appropriate SOP. These documents are retained at each laboratories' place of business and are available upon request for review.

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

The analytical instrument and equipment maintenance, testing, and inspection information are included in each laboratories' QAM and/or the appropriate SOP. These documents are retained at each laboratories' place of business and are available upon request for review.

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

Sampling Organization: C.T. Male and BEC

Laboratories: ELLE of Lancaster, PA; EATL of Folsom, CA

Method of sample delivery (shipper/carrier): FedEx/UPS/Courier

Number of days from reporting until sample disposal: As documented in each laboratories' QAM

The FSP describes the various methods and techniques to be followed during the completion of the sampling activities, instrument operation and calibration, and chain-of-custody procedures. As described in the FSP and SOPs, specific precautions will be implemented when sampling for PFAS compounds to prevent cross contamination.

QAPP Worksheet #28 –Analytical Quality Control and Corrective Action

The analytical quality control and corrective action information are included in each laboratories' QAM and/or the appropriate SOP. These documents are retained at each laboratories' place of business and are available upon request for review. Corrective action may be requested of the laboratories if issues arise that affect the quality of the data.

QAPP Worksheet #29 – Project Documents and Records Table

The documents and records that will be generated for the project including, but not limited to, sample collection and field measurement, on-site and off-site analysis, and data assessment, are noted below.

Documents and Records	Generation	Verification	Where Maintained
Field Documents Field Notes Field Sample Forms COC Records Field Instrument Calibration Logs Sampling Notes Photographs	C.T. Male and BEC Field Staff	C.T. Male and BEC Project Manager or designees	Field documents generated by C.T. Male field staff will be maintained in the project file located at C.T. Male offices. Field documents generated by BEC field staff will be maintained in the project file located at BEC's office. Copies of field documents generated by C.T. Male and BEC field staff will be exchanged between firms as needed. Field records entered by C.T. Male and BEC field staff via mobile apps will be stored in the project database maintained by BEC.
Project Report Documents Project sign-off forms Project report submittals	C.T. Male and BEC Project Staff	C.T. Male and BEC Project Manager	Report documents will be maintained in the project file located at C.T. Male offices which are kept following C.T. Male's policies and in the project file at BEC's office which are kept following BEC's policies.
Laboratory Documents Sample receipt, custody, and tracking record Equipment calibration logs (electronically stored) Sample preparation logs (electronically stored) Analysis Run Logs (electronically stored) Raw data	Laboratory Project Manager	Laboratory QA Manager	As detailed in each laboratories' QAM, data are typically retained for a period of 5 years from the report date.
Correspondence	C.T. Male and BEC Project Staff	C.T. Male Project Manager and BEC Project Manager	Project communications will be kept at C. T. Male offices, following C.T. Male's Records Management protocols, and in the project file at BEC offices, following BEC's policies.

Laboratory Data Deliverables				
Laboratory Record	PFAS	VOC	Metals	Other (non-organic)
Narrative	X	X	X	X
COC and any additional receiving documentation	X	X	X	X
Sample Results	X	X	X	X
QC Results	X	X	X	X
Raw Data (including but not limited to the following where appropriate - preparation logs, tune checks, initial calibrations, instrument logs, chromatograms)	X	X	X	X

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

Assessments:

Assessment Type	Responsible Party & Organization	Number/ Frequency	Estimated Dates	Assessment Deliverable	Deliverable due date
Review of field procedures	C.T. Male - QA Manager and/or Project Manager and/or designee for work completed by C.T. Male BEC - QA Manager and/or Project Manager for work completed by BEC	As warranted by identification of an exception to protocols	Determined in accordance to the level of exception	On-site audit and documentation of corrective action, as required by exception	1 month from completion of audit and assessment
Review of field notes/deviations from work plans	C.T. Male – QA Manager and/or Project Manager and/or designee for work completed by C.T. Male BEC – QA Manager and/or Project Manager for work completed by BEC	Upon completion of routine monitoring round or investigation phase	Ongoing	Documentation of review	With the completion of an investigation or monitoring progress report.
Review of COCs	C.T. Male – Laboratory / C.T. Male QA Manager and/or designee for samples collected by C.T. Male BEC - Laboratory / BEC QA Manager for samples collected by BEC	Every event/report	Within 5 days of receipt	Documentation of review	Ongoing
Review/validation of analytical reports	Environmental Standards, Inc.	Level IIA every event / report and Level IV determined on a case-by-case basis	Ongoing	Evaluation or validation report entitled DUSR	Ongoing

Assessment Response and Corrective Action:

Assessment Type	Responsibility for responding to assessment findings	Assessment Response Documentation	Timeframe for Response	Responsibility for Implementing Corrective Action	Responsible for monitoring
Review of field procedures	C.T. Male - QA Manager and/or Project Manager	Written report	30 days	Project Manager and/or QA Manager, C.T. Male	Project Manager and/or QA Manager, C.T. Male
Review of field notes/deviations from work plans	C.T. Male – Project Manager	Note in field notes, project file, retained in correspondence	Immediately to within 3 days of deviation	Project Manager and/or QA Manager, C.T. Male	QA Manager, C.T. Male
Review of COCs	C.T. Male - QA Manager / Laboratory BEC - QA Manager and/or Project Manager for work completed by BEC	Note on COC	Immediately to within 3 days of when discrepancy noted	QA Manager, C.T. Male QA Manager and/or Project Manager for work completed by BEC	QA Manager, C.T. Male QA Manager and/or Project Manager for work completed by BEC
Review/Validation of Analytical Reports	Laboratory / Environmental Standards	QA/QC Summary Sheet	Immediately to within 3 days of when discrepancy noted	QA Manager, C.T. Male Project Manager, Laboratory	QA Manager, C.T. Male Project Manager, Laboratory

QAPP Worksheet #34 – Data Verification and Validation Inputs Table

The following worksheets define the data verification and validation process. This worksheet describes how each item will be verified. Worksheets #35 and #36 describe when specific activities will occur, what documentation is necessary and identifies the person(s) responsible for field and analytical data, respectively.

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

Item	Description	Verification (completeness)	Validation (conformance to specifications)
Analytical Data Package (cont.)			
21	Compound(s) identified and reported in proper units	X	X
22	Labeled sample chromatograms (organics)	X	X
23	Electronic data deliverable	X	X
24	Communication records (if applicable)	X	X
25	MDL/RL establishment and verification	X	X
26	Standards traceability	X	X
27	Instrument calibration records	X	X
28	Corrective action reports	X	X
29	Raw data	X	X

QAPP Worksheet #35 – Data Verification Procedures Table

Described below are the processes that will be followed to validate project field data.

Records Reviewed	Requirement Documents	Process Description	Responsible Person, Organization
Field notes and forms	QAPP, Field SOPs	Verify that records are present and complete for each day of field activities. Verify that planned samples were collected and that sample collection locations are documented. Verify that changes/exceptions are documented and reported in accordance with requirements. Verify that required field monitoring was performed and results are documented.	C.T. Male Project Manager or designee for work completed by C.T. Male field staff. BEC Project Manager for work completed by BEC field staff.
COC forms	QAPP, Field SOPs	Verify the completeness of COC records. Examine entries for consistency with the field notes. Verify that required signatures and dates are present. Check for transcription errors.	C.T. Male Project Manager or designee for work completed by C.T. Male field staff. BEC Project Manager for work completed by BEC field staff.
Laboratory analytical reports	QAPP	Level IIA data review is performed for every event/report. Level IV is determined on a case-by-case basis. The evaluation/validation report entitled DUSR will be provided to NYSDEC.	Environmental Standards, Inc.

QAPP Worksheet #36 – Data Validation Procedures

The data validator is responsible for review of the analytical data generated for this site. The data validator will review applicable analytical data and prepare a report documenting if the analytical data are valid and usable. The report will also present data rejection and qualification, where necessary, based on laboratory performance.

External data validation will be performed by an independent data validator who will utilize the applicable analytical method, standard laboratory practices and where applicable, the USEPA National and Regional Validation Guidelines/Procedures to determine the applicable qualifications of the data. This will include an evaluation of the laboratory raw data which may include but is not limited to the following:

- Analytical holding times
- Instrument performance checks
- Initial and continuing calibration
- Blanks
- Laboratory control samples
- Deuterated/surrogate compounds
- MS/MSD samples
- Internal standards
- Target compound identification
- Target compound quantitation
- System performance
- Overall assessment of data

The validator will then prepare a summary of the review entitled DUSR. The data validation company for this project is Environmental Standards, Inc. Their resumes can be found in Attachment A.

QAPP Worksheet #37 – Data Usability Assessment

Described below are the procedures / methods / activities that will be used to determine whether data are of the right type, quality, and quantity to support environmental decision making for the investigation portions of the project. Also noted are how data quality issues will be addressed and how limitations on the use of the data will be handled.

Personnel (organization and position/title) responsible for participating in the data usability assessment: C.T. Male Project Manager, C.T. Male QA Manager, BEC Project Manager, and BEC QA Manager.

The usability of the data will be assessed based on a review of the field measurements and laboratory results. The laboratory results will be reviewed by the laboratory prior to submittal and by the project team.

Step 1	Review the project's objectives and sampling design Review the key outputs defined during systematic planning (i.e., DQOs) to check they are still applicable. Review the sampling design for consistency with stated objectives. This step provides the context for interpreting the data in subsequent steps.
Step 2	Review the data verification and data validation outputs Review available QA reports, including the data verification and/or data validation reports. Perform basic calculations and summarize the data (using graphs, maps, tables, etc.). Look for patterns, trends, and anomalies (i.e., unexpected results). Review deviations from planned activities (e.g., number and locations of samples, holding time exceedances, damaged samples, and SOP deviations) and determine their impacts on the data usability. Evaluate implications of unacceptable QC sample results.
Step 3	Verify the assumptions of the selected statistical method Verify whether underlying assumptions for selected statistical methods (if documented in the QAPP) are valid. Common assumptions include the distributional form of the data, independence of the data, dispersion characteristics, homogeneity, etc. Depending on the robustness of the statistical method, minor deviations from assumptions usually are not critical to statistical analysis and data interpretation. If serious deviations from assumptions are discovered, then another statistical method may need to be selected.

Step 4	Implement the statistical method Implement the specified statistical procedures for analyzing the data and review underlying assumptions. For decision projects that involve hypothesis testing (e.g., "concentrations of lead in groundwater are below the action level") consider the consequences for selecting the incorrect alternative; for estimation projects (e.g., establishing a boundary for surface soil contamination), consider the tolerance for uncertainty in measurements.
Step 5	Document data usability and draw conclusions Determine if the data can be used as intended, considering implications of deviations and corrective actions. Discuss data quality indicators. Assess the performance of the sampling design and identify limitations on data use. Update the conceptual site model and document conclusions in the site investigation report.

References

- C.T. Male, 2016a. Final Draft Site Characterization Work Plan. Saint-Gobain Performance Plastics Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048. April 6, 2016 revised July 15, 2016.
- C.T. Male, 2016b. Final Remedial Investigation/Feasibility Study Work Plan. Saint-Gobain Performance Plastics, McCaffrey Street Site 14 McCaffrey Street. Village of Hoosick Falls, Rensselaer County. DEC Site No.: 442046. May 2016 revised August 30, 2016.
- C.T. Male, 2019a. Reduction of Groundwater Analytical Parameters and Sampling Frequency. Saint-Gobain Performance Plastics, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442048. May 17, 2019.
- C.T. Male, 2019b. Reduction of Groundwater Analytical Parameters and Sampling Frequency. Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046. May 17, 2019.
- NYSDEC, 2019. Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs. February 2019.

Tables

Table 1
Laboratory Analyses
Hoosick Falls, NY QAPP Revision 1

Eurofins Lancaster Laboratories, LLC. (ELLE) 2425 New Holland Pike Lancaster, Pennsylvania 17605	PFAS (solid, water) – EPA 537 Version 1.1 modified PFAS, SPLP (solid) – SW-846 1312, EPA 537 Version1.1 modified TCL VOCs (solid, water) – SW-846 8260 TAL Metals (solid, water) – SW-846 6020 / 7471 / 7470 Total Organic Carbon (TOC) (solid, water) – Lloyd Kahn, SM 5310 C % moisture (solid) – SM 2540 G pH – SW-846 9045 VOCs (air) – EPA TO-15
Eurofins Air Toxics, Inc. (EATL) 180 Blue Ravine Rd Folsom, California 95630	VOCs (air) – EPA TO-15

Specific parameter lists are included in Table 2.

Table 2A
Water Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Unit	MS/MSD Limits	LCS/LCSD Limits	RPD
Per- and Polyfluoroalkyl Substances (PFAS)							
6:2 Fluorotelomersulfonic acid (6:2 FTS)	EPA 537 Version 1.1 Modified^	2.0	5.0	ng/L	56-140	56-140	30
8:2 Fluorotelomersulfonic acid (8:2 FTS)	EPA 537 Version 1.1 Modified^	1.0	3.0	ng/L	58-143	58-143	30
NEtFOSAA	EPA 537 Version 1.1 Modified^	0.50	3.0	ng/L	53-140	53-140	30
NMeFOSAA	EPA 537 Version 1.1 Modified^	0.60	2.0	ng/L	59-141	59-141	30
Perfluorobutanesulfonic acid (PFBS)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	67-135	67-135	30
Perfluorobutanoic acid (PFBA)	EPA 537 Version 1.1 Modified^	2.0	5.0	ng/L	63-160	63-160	30
Perfluorodecanesulfonic acid (PFDS)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	62-135	62-135	30
Perfluorodecanoic acid (PFDA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	66-141	66-141	30
Perfluorododecanoic acid (PFDoDA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	65-143	65-143	30
Perfluoroheptanesulfonic acid (PFHpS)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	67-138	67-138	30
Perfluoroheptanoic acid (PFHpA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	69-144	69-144	30
Perfluorohexanesulfonic acid (PFHxS)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	63-132	63-132	30
Perfluorohexanoic acid (PFHxA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	69-139	69-139	30
Perfluorononanoic acid (PFNA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	66-144	66-144	30
Perfluorooctanesulfonamide (PFOSA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	67-126	67-126	30
Perfluorooctanesulfonic acid (PFOS)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	53-129	53-129	30
Perfluorooctanoic acid (PFOA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	67-139	67-139	30
Perfluoropentanoic acid (PFPA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	73-135	73-135	30
Perfluorotetradecanoic acid (PFTA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	69-141	69-141	30
Perfluorotridecanoic acid (PFTriA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	66-146	66-146	30
Perfluoroundecanoic acid (PFUnDA)	EPA 537 Version 1.1 Modified^	0.50	2.0	ng/L	66-140	66-140	30
TCL VOCs							
1,1,1-Trichloroethane	SW-846 8260C	0.30	1.0	µg/L	67-126	67-126	30
1,1,2,2-Tetrachloroethane	SW-846 8260C	0.20	1.0	µg/L	72-120	72-120	30
1,1,2-Trichloroethane	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
1,1-Dichloroethane	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
1,1-Dichloroethene	SW-846 8260C	0.20	1.0	µg/L	80-131	80-131	30
1,2,3-Trichlorobenzene	SW-846 8260C	0.40	5.0	µg/L	66-120	66-120	30
1,2,4-Trichlorobenzene	SW-846 8260C	0.30	5.0	µg/L	63-120	63-120	30
1,2-Dibromo-3-chloropropane	SW-846 8260C	0.30	5.0	µg/L	47-131	47-131	30

Table 2A
Water Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Unit	MS/MSD Limits	LCS/LCSD Limits	RPD
1,2-Dibromoethane	SW-846 8260C	0.20	1.0	µg/L	77-120	77-120	30
1,2-Dichlorobenzene	SW-846 8260C	0.20	5.0	µg/L	80-120	80-120	30
1,2-Dichloroethane	SW-846 8260C	0.30	1.0	µg/L	73-124	73-124	30
1,2-Dichloropropane	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
1,3-Dichlorobenzene	SW-846 8260C	0.20	5.0	µg/L	80-120	80-120	30
1,4-Dichlorobenzene	SW-846 8260C	0.20	5.0	µg/L	80-120	80-120	30
2-Butanone	SW-846 8260C	0.30	10	µg/L	59-135	59-135	30
2-Hexanone	SW-846 8260C	0.30	10	µg/L	56-135	56-135	30
4-Methyl-2-pentanone	SW-846 8260C	0.50	10	µg/L	62-133	62-133	30
Acetone	SW-846 8260C	0.70	20	µg/L	54-157	54-157	30
Benzene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
Bromochloromethane	SW-846 8260C	0.20	5.0	µg/L	80-120	80-120	30
Bromodichloromethane	SW-846 8260C	0.20	1.0	µg/L	71-120	71-120	30
Bromoform	SW-846 8260C	0.20	4.0	µg/L	51-120	51-120	30
Bromomethane	SW-846 8260C	0.30	1.0	µg/L	53-128	53-128	30
Carbon Disulfide	SW-846 8260C	0.20	5.0	µg/L	65-128	65-128	30
Carbon Tetrachloride	SW-846 8260C	0.20	1.0	µg/L	64-134	64-134	30
Chlorobenzene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
Chloroethane	SW-846 8260C	0.20	1.0	µg/L	55-123	55-123	30
Chloroform	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
Chloromethane	SW-846 8260C	0.20	1.0	µg/L	56-121	56-121	30
cis-1,2-Dichloroethene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
cis-1,3-Dichloropropene	SW-846 8260C	0.20	1.0	µg/L	75-120	75-120	30
Cyclohexane	SW-846 8260C	0.20	5.0	µg/L	68-126	68-126	30
Dibromochloromethane	SW-846 8260C	0.20	1.0	µg/L	71-120	71-120	30
Dichlorodifluoromethane	SW-846 8260C	0.20	1.0	µg/L	41-127	41-127	30
Ethylbenzene	SW-846 8260C	0.40	1.0	µg/L	80-120	80-120	30
Freon 113	SW-846 8260C	0.20	10	µg/L	73-139	73-139	30
Isopropylbenzene	SW-846 8260C	0.20	5.0	µg/L	80-120	80-120	30
m+p-Xylene	SW-846 8260C	1.0	5.0	µg/L	80-120	80-120	30
Methyl Acetate	SW-846 8260C	0.20	5.0	µg/L	54-136	54-136	30

Table 2A
Water Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Unit	MS/MSD Limits	LCS/LCSD Limits	RPD
Methyl Tertiary Butyl Ether	SW-846 8260C	0.20	1.0	µg/L	69-122	69-122	30
Methylcyclohexane	SW-846 8260C	0.20	5.0	µg/L	67-121	67-121	30
Methylene Chloride	SW-846 8260C	0.30	1.0	µg/L	80-120	80-120	30
o-Xylene	SW-846 8260C	0.40	1.0	µg/L	80-120	80-120	30
Styrene	SW-846 8260C	0.20	5.0	µg/L	80-120	80-120	30
Tetrachloroethene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
Toluene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
trans-1,2-Dichloroethene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
trans-1,3-Dichloropropene	SW-846 8260C	0.20	1.0	µg/L	67-120	67-120	30
Trichloroethene	SW-846 8260C	0.20	1.0	µg/L	80-120	80-120	30
Trichlorofluoromethane	SW-846 8260C	0.20	1.0	µg/L	55-135	55-135	30
Vinyl Chloride	SW-846 8260C	0.20	1.0	µg/L	56-120	56-120	30
TAL Metals							
Aluminum	SW-846 6020A/B	0.0197	0.025	mg/L	75-125	88-114	20
Antimony	SW-846 6020A/B	0.000406	0.0010	mg/L	75-125	80-120	20
Arsenic	SW-846 6020A/B	0.00068	0.0020	mg/L	75-125	85-120	20
Barium	SW-846 6020A/B	0.000746	0.0020	mg/L	75-125	80-120	20
Beryllium	SW-846 6020A/B	0.000091	0.00050	mg/L	75-125	90-112	20
Cadmium	SW-846 6020A/B	0.000151	0.00050	mg/L	75-125	83-120	20
Calcium *	SW-846 6020A/B	0.0736	0.10	mg/L	75-125	85-120	20
Chromium	SW-846 6020A/B	0.00034	0.0010	mg/L	75-125	90-115	20
Cobalt	SW-846 6020A/B	0.000156	0.0050	mg/L	80-120	86-113	20
Copper	SW-846 6020A/B	0.000362	0.001	mg/L	75-125	89-120	20
Iron *	SW-846 6020A/B	0.0228	0.050	mg/L	75-125	87-114	20
Lead	SW-846 6020A/B	0.000071	0.00050	mg/L	75-125	90-110	20
Magnesium *	SW-846 6020A/B	0.0104	0.050	mg/L	75-125	90-112	20
Manganese *	SW-846 6020A/B	0.000634	0.0020	mg/L	75-125	89-120	20
Mercury	SW-846 7470A	0.000050	0.00020	mg/L	80-120	80-110	20
Nickel	SW-846 6020A/B	0.000604	0.0010	mg/L	75-125	90-114	20
Potassium *	SW-846 6020A/B	0.107	0.20	mg/L	75-125	90-112	20
Selenium	SW-846 6020A/B	0.000278	0.0010	mg/L	75-125	90-113	20

Table 2A
Water Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Unit	MS/MSD Limits	LCS/LCSD Limits	RPD
Silver	SW-846 6020A/B	0.00017	0.00050	mg/L	75-125	88-113	20
Sodium *	SW-846 6020A/B	0.050	0.20	mg/L	75-125	89-112	20
Thallium	SW-846 6020A/B	0.00013	0.00050	mg/L	75-125	80-120	20
Vanadium	SW-846 6020A/B	0.000236	0.00050	mg/L	75-125	90-115	20
Zinc	SW-846 6020A/B	0.006177	0.010	mg/L	75-125	90-115	20
General Parameters							
Total Organic Carbon (TOC)	SM 5310C	0.50	1.0	mg/L	91-113	91-113	20/9

* Cations

MDL, LOQ/RL, and QC limits are evaluated periodically and are subject to change.

^ Modifications to methods are summarized in Worksheet #23

MDL and LOQ/RL may vary based on initial volume, dilution factor, and possible matrix interferences.

MDL - Method Detection Limit

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

RPD - Relative Percent Difference (if #/# - first # = spike criteria, second # = sample criteria)

Table 2B
Solid Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Per- and Polyfluoroalkyl Substances (PFAS)							
6:2 Fluorotelomersulfonic acid	EPA 537 Version 1.1 Modified^	0.60	2.0	ng/g	51-144	51-144	30
8:2 Fluorotelomersulfonic acid	EPA 537 Version 1.1 Modified^	0.60	3.0	ng/g	54-152	54-152	30
NEtFOSAA	EPA 537 Version 1.1 Modified^	0.20	2.0	ng/g	51-145	51-145	30
NMeFOSAA	EPA 537 Version 1.1 Modified^	0.20	2.0	ng/g	55-152	55-152	30
Perfluorobutanesulfonic acid (PFBS)	EPA 537 Version 1.1 Modified^	0.40	2.0	ng/g	63-139	63-139	30
Perfluorobutanoic acid (PFBA)	EPA 537 Version 1.1 Modified^	0.80	2.0	ng/g	56-188	56-188	30
Perfluorodecanesulfonic acid (PFDS)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	60-142	60-142	30
Perfluorodecanoic acid (PFDA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	65-144	65-144	30
Perfluorododecanoic acid (PFDoDA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	62-150	62-150	30
Perfluoroheptanesulfonic acid (PFHpS)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	67-139	67-139	30
Perfluoroheptanoic acid (PFHpA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	65-153	65-153	30
Perfluorohexanesulfonic acid (PFHxS)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	59-139	59-139	30
Perfluorohexanoic acid (PFHxA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	64-149	64-149	30
Perfluorononanoic acid (PFNA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	64-151	64-151	30
Perfluorooctanesulfonamide (PFOSA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	61-133	61-133	30
Perfluorooctanesulfonic acid (PFOS)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	54-132	54-132	30
Perfluorooctanoic acid (PFOA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	65-147	65-147	30
Perfluoropentanoic acid (PFPA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	71-139	71-139	30
Perfluorotetradecanoic acid (PFTA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	66-147	66-147	30
Perfluorotridecanoic acid (PFTriA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	63-152	63-152	30
Perfluoroundecanoic acid (PFUnDA)	EPA 537 Version 1.1 Modified^	0.20	0.60	ng/g	65-146	65-146	30
TCL VOCs							
1,1,1-Trichloroethane	SW-846 8260C	0.60	5.0	ug/kg	69-123	69-123	30
1,1,2,2-Tetrachloroethane	SW-846 8260C	0.40	5.0	ug/kg	69-125	69-125	30
1,1,2-Trichloroethane	SW-846 8260C	0.50	5.0	ug/kg	80-120	80-120	30
1,1-Dichloroethane	SW-846 8260C	0.50	5.0	ug/kg	79-120	79-120	30
1,1-Dichloroethene	SW-846 8260C	0.50	5.0	ug/kg	73-129	73-129	30
1,2,3-Trichlorobenzene	SW-846 8260C	5.0	10	ug/kg	57-131	57-131	30
1,2,4-Trichlorobenzene	SW-846 8260C	5.0	10	ug/kg	56-130	56-130	30
1,2-Dibromo-3-chloropropane	SW-846 8260C	0.50	5.0	ug/kg	48-134	48-134	30

Table 2B
Solid Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
1,2-Dibromoethane	SW-846 8260C	0.40	5.0	ug/kg	76-120	76-120	30
1,2-Dichlorobenzene	SW-846 8260C	0.50	5.0	ug/kg	76-120	76-120	30
1,2-Dichloroethane	SW-846 8260C	0.60	5.0	ug/kg	71-128	71-128	30
1,2-Dichloropropane	SW-846 8260C	0.50	5.0	ug/kg	80-120	80-120	30
1,3-Dichlorobenzene	SW-846 8260C	0.50	5.0	ug/kg	75-120	75-120	30
1,4-Dichlorobenzene	SW-846 8260C	0.40	5.0	ug/kg	80-120	80-120	30
2-Butanone	SW-846 8260C	1.0	10	ug/kg	57-128	57-128	30
2-Hexanone	SW-846 8260C	1.0	10	ug/kg	54-140	54-140	30
4-Methyl-2-pentanone	SW-846 8260C	1.0	10	ug/kg	67-128	67-128	30
Acetone	SW-846 8260C	6.0	20	ug/kg	41-150	41-150	30
Benzene	SW-846 8260C	0.50	5.0	ug/kg	80-120	80-120	30
Bromochloromethane	SW-846 8260C	0.60	5.0	ug/kg	72-124	72-124	30
Bromodichloromethane	SW-846 8260C	0.40	5.0	ug/kg	70-120	70-120	30
Bromoform	SW-846 8260C	5.0	10	ug/kg	51-127	51-127	30
Bromomethane	SW-846 8260C	0.70	5.0	ug/kg	45-140	45-140	30
Carbon Disulfide	SW-846 8260C	0.60	5.0	ug/kg	64-133	64-133	30
Carbon Tetrachloride	SW-846 8260C	0.50	5.0	ug/kg	64-134	64-134	30
Chlorobenzene	SW-846 8260C	0.50	5.0	ug/kg	80-120	80-120	30
Chloroethane	SW-846 8260C	1.0	5.0	ug/kg	43-135	43-135	30
Chloroform	SW-846 8260C	0.60	5.0	ug/kg	80-120	80-120	30
Chloromethane	SW-846 8260C	0.60	5.0	ug/kg	56-120	56-120	30
cis-1,2-Dichloroethene	SW-846 8260C	0.50	5.0	ug/kg	80-123	80-123	30
cis-1,3-Dichloropropene	SW-846 8260C	0.40	5.0	ug/kg	66-120	66-120	30
Cyclohexane	SW-846 8260C	0.50	5.0	ug/kg	58-126	58-126	30
Dibromochloromethane	SW-846 8260C	0.50	5.0	ug/kg	69-125	69-125	30
Dichlorodifluoromethane	SW-846 8260C	0.60	5.0	ug/kg	21-127	21-127	30
Ethylbenzene	SW-846 8260C	0.40	5.0	ug/kg	78-120	78-120	30
Freon 113	SW-846 8260C	0.60	10	ug/kg	64-135	64-135	30
Isopropylbenzene	SW-846 8260C	0.40	5.0	ug/kg	77-120	77-120	30
m+p-Xylene	SW-846 8260C	1.0	5.0	ug/kg	80-120	80-120	30
Methyl Acetate	SW-846 8260C	1.0	5.0	ug/kg	67-128	67-128	30

Table 2B
Solid Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Methyl Tertiary Butyl Ether	SW-846 8260C	0.50	5.0	ug/kg	72-120	72-120	30
Methylcyclohexane	SW-846 8260C	0.60	5.0	ug/kg	61-124	61-124	30
Methylene Chloride	SW-846 8260C	2.0	5.0	ug/kg	76-122	76-122	30
o-Xylene	SW-846 8260C	0.40	5.0	ug/kg	75-120	75-120	30
Styrene	SW-846 8260C	0.30	5.0	ug/kg	76-120	76-120	30
Tetrachloroethene	SW-846 8260C	0.50	5.0	ug/kg	73-120	73-120	30
Toluene	SW-846 8260C	0.60	5.0	ug/kg	80-120	80-120	30
trans-1,2-Dichloroethene	SW-846 8260C	0.50	5.0	ug/kg	80-125	80-125	30
trans-1,3-Dichloropropene	SW-846 8260C	0.50	5.0	ug/kg	68-122	68-122	30
Trichloroethene	SW-846 8260C	0.50	5.0	ug/kg	80-120	80-120	30
Trichlorofluoromethane	SW-846 8260C	0.70	5.0	ug/kg	55-134	55-134	30
Vinyl Chloride	SW-846 8260C	0.60	5.0	ug/kg	52-120	52-120	30
TAL Metals							
Aluminum	SW-846 6020A/B	8.738	20	mg/kg	90-110	80-120	20
Antimony	SW-846 6020A/B	0.1264	0.20	mg/kg	75-125	80-120	20
Arsenic	SW-846 6020A/B	0.1338	0.40	mg/kg	75-125	80-120	20
Barium	SW-846 6020A/B	0.183	0.40	mg/kg	75-125	80-120	20
Beryllium	SW-846 6020A/B	0.0238	0.060	mg/kg	75-125	80-120	20
Cadmium	SW-846 6020A/B	0.0504	0.10	mg/kg	75-125	80-120	20
Calcium	SW-846 6020A/B	14.9806	40	mg/kg	75-125	80-120	20
Chromium	SW-846 6020A/B	0.1538	0.40	mg/kg	75-125	86-120	20
Cobalt	SW-846 6020A/B	0.0584	0.20	mg/kg	75-125	80-120	20
Copper	SW-846 6020A/B	0.1756	0.40	mg/kg	75-125	85-120	20
Iron	SW-846 6020A/B	7.50	20	mg/kg	75-125	80-120	20
Lead	SW-846 6020A/B	0.0504	0.20	mg/kg	75-125	85-120	20
Magnesium	SW-846 6020A/B	3.134	10	mg/kg	75-125	80-120	20
Manganese	SW-846 6020A/B	0.212	0.40	mg/kg	75-118	80-120	20
Mercury	SW-846 7471A/B	0.374	0.80	mg/kg	80-120	80-115	20
Nickel	SW-846 6020A/B	0.16	0.40	mg/kg	75-125	86-120	20
Potassium	SW-846 6020A/B	19.0488	40	mg/kg	75-125	80-120	20
Selenium	SW-846 6020A/B	0.1304	0.40	mg/kg	75-125	85-120	20

Table 2B
Solid Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Silver	SW-846 6020A/B	0.0406	0.10	mg/kg	75-125	84-120	20
Sodium	SW-846 6020A/B	26.7534	50	mg/kg	75-125	88-112	20
Thallium	SW-846 6020A/B	0.0392	0.10	mg/kg	75-125	80-120	20
Vanadium	SW-846 6020A/B	0.0858	0.20	mg/kg	75-125	86-120	20
Zinc	SW-846 6020A/B	0.535	2.0	mg/kg	75-125	85-120	20
General Parameters							
Total Organic Carbon (TOC)	Lloyd Kahn	100	300	mg/kg	47-143	47-143	20/7
% Moisture	SM 2540 G	0.50	0.50	%	---	---	5
pH	SW-846 9045D	---	---	Std. Unit	75-125	95-105	3

^ Modifications to methods are summarized in Worksheet #23

MDL, LOQ/RL, and QC limits are evaluated periodically and are subject to change.

MDL - Method Detection Limit

MDL and LOQ/RL may vary based on initial mass, dilution factor, % solids, and possible matrix interferences. Results will be reported on a dry weight basis.

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

RPD - Relative Percent Difference (if #/# - first # = spike criteria, second # = sample criteria)

Table 2C
Air Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
VOCs - ELLE							
1,1,1-Trichloroethane ²	EPA TO-15	0.65	5.5	µg/m ³	---	70-130	25
1,1,2,2-Tetrachloroethane	EPA TO-15	1.0	6.9	µg/m ³	---	68-138	25
1,1,2-Trichloroethane	EPA TO-15	0.65	5.5	µg/m ³	---	76-127	25
1,1-Dichloroethane	EPA TO-15	0.36	4.0	µg/m ³	---	70-130	25
1,1-Dichloroethene ¹	EPA TO-15	0.56	4.0	µg/m ³	---	70-131	25
1,2-Dibromo-3-chloropropane	EPA TO-15	2.7	19	µg/m ³	---	NA	NA
1,2-Dibromoethane (EDB)	EPA TO-15	1.0	7.7	µg/m ³	---	70-130	25
1,2-Dichlorobenzene	EPA TO-15	1.2	6.0	µg/m ³	---	61-139	25
1,2-Dichloroethane	EPA TO-15	0.32	4.0	µg/m ³	---	70-142	25
1,2-Dichloropropane	EPA TO-15	0.60	4.6	µg/m ³	---	70-130	25
1,3-Dichlorobenzene	EPA TO-15	1.1	6.0	µg/m ³	---	64-140	25
1,4-Dichlorobenzene	EPA TO-15	1.0	6.0	µg/m ³	---	64-137	25
2-Butanone (MEK)	EPA TO-15	0.62	2.9	µg/m ³	---	70-130	25
2-Hexanone	EPA TO-15	0.74	4.1	µg/m ³	---	63-144	25
4-Methyl-2-pentanone (MIBK)	EPA TO-15	0.61	4.1	µg/m ³	---	68-133	25
Acetone	EPA TO-15	1.3	12	µg/m ³	---	70-137	25
Benzene	EPA TO-15	0.35	3.2	µg/m ³	---	70-130	25
Bromodichloromethane	EPA TO-15	0.80	6.7	µg/m ³	---	75-134	25
Bromoform	EPA TO-15	1.8	10	µg/m ³	---	60-139	25
Bromomethane	EPA TO-15	0.70	3.9	µg/m ³	---	70-134	25
Carbon Disulfide	EPA TO-15	0.40	3.1	µg/m ³	---	70-130	25
Carbon Tetrachloride ¹	EPA TO-15	0.88	6.3	µg/m ³	---	70-130	25
Chlorobenzene	EPA TO-15	0.60	4.6	µg/m ³	---	76-117	25
Chloroethane	EPA TO-15	0.50	2.6	µg/m ³	---	70-131	25
Chloroform	EPA TO-15	0.45	4.9	µg/m ³	---	70-130	25
Chloromethane	EPA TO-15	0.50	2.1	µg/m ³	---	70-138	25
cis-1,2-Dichloroethene ¹	EPA TO-15	0.48	4.0	µg/m ³	---	70-130	25
cis-1,3-Dichloropropene	EPA TO-15	0.45	4.5	µg/m ³	---	70-130	25
Cumene (Isopropylbenzene)	EPA TO-15	1.2	4.9	µg/m ³	---	NA	NA
Cyclohexane	EPA TO-15	0.38	3.4	µg/m ³	---	NA	NA

Table 2C
Air Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Dibromochloromethane	EPA TO-15	1.1	8.5	µg/m ³	---	74-131	25
Dichlorodifluoromethane (Freon 12)	EPA TO-15	0.64	4.9	µg/m ³	---	70-131	25
Ethylbenzene	EPA TO-15	0.83	4.3	µg/m ³	---	70-130	25
Freon 113	EPA TO-15	0.84	7.7	µg/m ³	---	70-130	25
m/p-Xylene	EPA TO-15	1.1	8.7	µg/m ³	---	78-119	25
Methyl t-Butyl Ether	EPA TO-15	0.54	3.6	µg/m ³	---	70-130	25
Methylene Chloride ²	EPA TO-15	0.87	6.9	µg/m ³	---	70-139	25
o-Xylene	EPA TO-15	0.83	4.3	µg/m ³	---	70-130	25
Styrene	EPA TO-15	0.85	4.3	µg/m ³	---	70-133	25
Tetrachloroethene ²	EPA TO-15	1.7	14	µg/m ³	---	70-130	25
Toluene	EPA TO-15	0.45	3.8	µg/m ³	---	70-130	25
trans-1,2-Dichloroethene	EPA TO-15	0.34	4.0	µg/m ³	---	70-130	25
trans-1,3-Dichloropropene	EPA TO-15	0.54	4.5	µg/m ³	---	70-130	25
Trichloroethene ¹	EPA TO-15	0.97	5.4	µg/m ³	---	70-130	25
Trichlorofluoromethane (Freon 11)	EPA TO-15	0.84	5.6	µg/m ³	---	70-130	25
Vinyl Chloride ³	EPA TO-15	0.31	2.6	µg/m ³	---	70-135	25
VOCs - EATL⁴							
1,1,1-Trichloroethane ²	EPA TO-15	0.38	2.7	µg/m ³	---	70-130	25
1,1,2,2-Tetrachloroethane	EPA TO-15	0.21	3.4	µg/m ³	---	70-130	25
1,1,2-Trichloroethane	EPA TO-15	0.27	2.7	µg/m ³	---	70-130	25
1,1-Dichloroethane	EPA TO-15	0.32	2.0	µg/m ³	---	70-130	25
1,1-Dichloroethene ¹	EPA TO-15	0.44	2.0	µg/m ³	---	70-130	25
1,2-Dibromoethane (EDB)	EPA TO-15	0.23	3.8	µg/m ³	---	70-130	25
1,2-Dichlorobenzene	EPA TO-15	0.24	3.0	µg/m ³	---	70-130	25
1,2-Dichloroethane	EPA TO-15	0.16	2.0	µg/m ³	---	70-130	25
1,2-Dichloropropane	EPA TO-15	0.42	2.3	µg/m ³	---	70-130	25
1,3-Dichlorobenzene	EPA TO-15	0.12	3.0	µg/m ³	---	70-130	25
1,4-Dichlorobenzene	EPA TO-15	0.24	3.0	µg/m ³	---	70-130	25
2-Butanone (MEK)	EPA TO-15	0.59	5.9	µg/m ³	---	70-130	25
2-Hexanone	EPA TO-15	0.16	8.2	µg/m ³	---	70-130	25
4-Methyl-2-pentanone (MIBK)	EPA TO-15	0.94	2.0	µg/m ³	---	70-130	25

Table 2C
Air Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Acetone	EPA TO-15	2.09	12	µg/m ³	---	70-130	25
Benzene	EPA TO-15	0.19	1.6	µg/m ³	---	70-130	25
Bromodichloromethane	EPA TO-15	0.27	3.4	µg/m ³	---	70-130	25
Bromoform	EPA TO-15	0.21	5.2	µg/m ³	---	70-130	25
Bromomethane	EPA TO-15	1.36	19	µg/m ³	---	70-130	25
Carbon Disulfide	EPA TO-15	3.11	6.2	µg/m ³	---	70-130	25
Carbon Tetrachloride ¹	EPA TO-15	0.31	3.1	µg/m ³	---	70-130	25
Chlorobenzene	EPA TO-15	0.09	2.3	µg/m ³	---	70-130	25
Chloroethane	EPA TO-15	0.87	5.3	µg/m ³	---	70-130	25
Chloroform	EPA TO-15	0.34	2.4	µg/m ³	---	70-130	25
Chloromethane	EPA TO-15	0.76	10	µg/m ³	---	70-130	25
cis-1,2-Dichloroethene ¹	EPA TO-15	0.28	2.0	µg/m ³	---	70-130	25
cis-1,3-Dichloropropene	EPA TO-15	0.18	2.3	µg/m ³	---	70-130	25
Cumene (Isopropylbenzene)	EPA TO-15	0.20	2.5	µg/m ³	---	70-130	25
Cyclohexane	EPA TO-15	0.24	1.7	µg/m ³	---	70-130	25
Dibromochloromethane	EPA TO-15	0.26	4.3	µg/m ³	---	70-130	25
Dichlorodifluoromethane (Freon 12)	EPA TO-15	0.20	2.5	µg/m ³	---	70-130	25
Ethylbenzene	EPA TO-15	0.26	2.2	µg/m ³	---	70-130	25
Freon 113	EPA TO-15	0.61	3.8	µg/m ³	---	70-130	25
m/p-Xylene	EPA TO-15	0.22	2.2	µg/m ³	---	70-130	25
Methyl t-Butyl Ether	EPA TO-15	0.68	7.2	µg/m ³	---	70-130	25
Methylene Chloride ²	EPA TO-15	0.24	17	µg/m ³	---	70-130	25
o-Xylene	EPA TO-15	0.13	2.2	µg/m ³	---	70-130	25
Styrene	EPA TO-15	0.13	2.1	µg/m ³	---	70-130	25
Tetrachloroethene ²	EPA TO-15	0.47	3.4	µg/m ³	---	70-130	25
Toluene	EPA TO-15	0.19	1.9	µg/m ³	---	70-130	25
trans-1,2-Dichloroethene	EPA TO-15	0.40	2.0	µg/m ³	---	70-130	25
trans-1,3-Dichloropropene	EPA TO-15	0.09	2.3	µg/m ³	---	70-130	25
Trichloroethene ¹	EPA TO-15	0.32	2.7	µg/m ³	---	70-130	25
Trichlorofluoromethane (Freon 11)	EPA TO-15	0.45	2.8	µg/m ³	---	70-130	25
Vinyl Chloride ³	EPA TO-15	0.20	1.3	µg/m ³	---	70-130	25

Table 2C
Air Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
VOCs - EATL - Low Level Analysis							
1,2-Dichlorobenzene	EPA TO-15, Low Level	0.03	0.1	ppbv	---	Same as EATL TO-15 analysis	
1,2-Dichloropropane	EPA TO-15, Low Level	0.04	0.1	ppbv	---		
1,3-Dichlorobenzene	EPA TO-15, Low Level	0.03	0.1	ppbv	---		
2-Butanone (Methyl Ethyl Ketone)	EPA TO-15, Low Level	0.10	0.5	ppbv	---		
2-Hexanone	EPA TO-15, Low Level	0.13	0.5	ppbv	---		
4-Methyl-2-pentanone	EPA TO-15, Low Level	0.03	0.1	ppbv	---		
Acetone	EPA TO-15, Low Level	0.33	1.0	ppbv	---		
Bromodichloromethane	EPA TO-15, Low Level	0.05	0.1	ppbv	---		
Bromoform	EPA TO-15, Low Level	0.03	0.1	ppbv	---		
Bromomethane	EPA TO-15, Low Level	0.13	0.5	ppbv	---		
Carbon Disulfide	EPA TO-15, Low Level	0.03	0.5	ppbv	---		
Chlorobenzene	EPA TO-15, Low Level	0.04	0.1	ppbv	---		
cis-1,3-Dichloropropene	EPA TO-15, Low Level	0.03	0.1	ppbv	---		
Cumene	EPA TO-15, Low Level	0.01	0.1	ppbv	---		
Cyclohexane	EPA TO-15, Low Level	0.04	0.1	ppbv	---		
Dibromochloromethane	EPA TO-15, Low Level	0.04	0.1	ppbv	---		
Freon 11	EPA TO-15, Low Level	.0.2	0.1	ppbv	---		
Freon 113	EPA TO-15, Low Level	0.04	0.1	ppbv	---		
Methylene Chloride	EPA TO-15, Low Level	0.13	0.2	ppbv	---		
Styrene	EPA TO-15, Low Level	0.20	0.1	ppbv	---		
Toluene	EPA TO-15, Low Level	0.03	0.1	ppbv	---		
trans-1,3-Dichloropropene	EPA TO-15, Low Level	0.04	0.1	ppbv	---		
VOCs - EATL - SIM Analysis							
1,1,1-Trichloroethane	EPA TO-15 SIM	0.002	0.02	ppbv	---	Same as EATL TO-15 analysis	
1,1,2,2-Tetrachloroethane	EPA TO-15 SIM	0.005	0.02	ppbv	---		
1,1,2-Trichloroethane	EPA TO-15 SIM	0.002	0.02	ppbv	---		
1,1-Dichloroethane	EPA TO-15 SIM	0.002	0.02	ppbv	---		
1,1-Dichloroethene	EPA TO-15 SIM	0.003	0.01	ppbv	---		
1,2-Dibromoethane (EDB)	EPA TO-15 SIM	0.005	0.02	ppbv	---		
1,2-Dichloroethane	EPA TO-15 SIM	0.003	0.02	ppbv	---		

Table 2C
Air Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
1,4-Dichlorobenzene	EPA TO-15 SIM	0.011	0.02	ppbv	---	Same as EATL TO-15 analysis	
Benzene	EPA TO-15 SIM	0.004	0.05	ppbv	---		
Carbon Tetrachloride	EPA TO-15 SIM	0.01	0.01	ppbv	---		
Chloroethane	EPA TO-15 SIM	0.045	0.05	ppbv	---		
Chloroform	EPA TO-15 SIM	0.004	0.02	ppbv	---		
Chloromethane	EPA TO-15 SIM	0.009	0.5	ppbv	---		
cis-1,2-Dichloroethene	EPA TO-15 SIM	0.003	0.01	ppbv	---		
Ethyl Benzene	EPA TO-15 SIM	0.002	0.02	ppbv	---		
Freon 12	EPA TO-15 SIM	0.004	0.02	ppbv	---		
m,p-Xylene	EPA TO-15 SIM	0.003	0.04	ppbv	---		
Methyl tert-butyl ether	EPA TO-15 SIM	0.002	0.1	ppbv	---		
o-Xylene	EPA TO-15 SIM	0.003	0.02	ppbv	---		
Tetrachloroethene	EPA TO-15 SIM	0.002	0.02	ppbv	---		
trans-1,2-Dichloroethene	EPA TO-15 SIM	0.004	0.1	ppbv	---		
Trichloroethene	EPA TO-15 SIM	0.002	0.01	ppbv	---		
Vinyl Chloride	EPA TO-15 SIM	0.003	0.01	ppbv	---		

[^] Modifications to methods are summarized in Worksheet #23

MDL, LOQ/RL, and QC limits are evaluated periodically and are subject to change.

¹ New York State Department of Health Soil Vapor/Indoor Air Matrix A

MDL and LOQ/RL may vary based on initial volume, dilution factor, and possible matrix interferences.

² New York State Department of Health Soil Vapor/Indoor Air Matrix B

³ New York State Department of Health Soil Vapor/Indoor Air Matrix C

⁴ EATL has developed a high sensitivity, high selectivity analysis to measure target analytes when high levels of non-target analytes are present. Limits will be provided in the laboratory reports.

MDL - Method Detection Limit

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

RPD - Relative Percent Difference

Table 2D
SPLP Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 1

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Per- and Polyfluoroalkyl Substances (PFAS)							
6:2 Fluorotelomersulfonic acid	EPA 1312 / EPA 537 Version 1.1 Modified^	2.0	5.0	ng/l	70-130	66-155	30
8:2 Fluorotelomersulfonic acid	EPA 1312 / EPA 537 Version 1.1 Modified^	1.0	3.0	ng/l	60-150	66-148	30
NEtFOSAA	EPA 1312 / EPA 537 Version 1.1 Modified^	0.5	3.0	ng/l	49-159	55-169	30
NMeFOSAA	EPA 1312 / EPA 537 Version 1.1 Modified^	0.6	2.0	ng/l	58-157	44-147	30
Perfluorobutanesulfonic acid (PFBS)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	73-134	73-128	30
Perfluorobutanoic acid (PFBA)	EPA 1312 / EPA 537 Version 1.1 Modified^	2.0	5.0	ng/l	58-155	74-142	30
Perfluorodecanesulfonic acid (PFDS)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	41-148	60-135	30
Perfluorodecanoic acid (PFDA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	73-142	69-148	30
Perfluorododecanoic acid (PFDoDA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	76-136	75-136	30
Perfluoroheptanesulfonic acid (PFHpS)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	50-145	64-135	30
Perfluoroheptanoic acid (PFHpA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	67-137	76-140	30
Perfluorohexanesulfonic acid (PFHxS)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	73-129	71-131	30
Perfluorohexanoic acid (PFHxA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	70-130	75-135	30
Perfluorononanoic acid (PFNA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	70-130	72-148	30
Perfluorooctanesulfonamide (PFOSA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	70-130	65-164	30
Perfluorooctanesulfonic acid (PFOS)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	48-154	67-138	30
Perfluorooctanoic acid (PFOA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	48-160	72-138	30
Perfluoropentanoic acid (PFPA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	53-161	74-134	30
Perfluorotetradecanoic acid (PFTA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	78-133	74-135	30
Perfluorotridecanoic acid (PFTriA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	57-151	61-145	30
Perfluoroundecanoic acid (PFUnDA)	EPA 1312 / EPA 537 Version 1.1 Modified^	0.50	2.0	ng/l	66-137	75-146	30

^ Modifications to methods are summarized in Worksheet #23

MDL, LOQ/RL, and QC limits are evaluated periodically and are subject to change.

MDL - Method Detection Limit

MDL and LOQ/RL may vary based on initial volume, dilution factor, and possible matrix interferences.

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

RPD - Relative Percent Difference

Attachment A

Personnel Resumés

C. T. Male Associates

Daniel P. Reilly, P.E.

*Division Manager - Environmental Services
Director of Operations*



Professional Background:

Licensed Professional Engineer –
New York

Education:

Bachelor of Science,
Environmental Engineering,
Rensselaer Polytechnic Institute,
Troy, NY

Professional Affiliations:

Eastern NY Chapter Air & Waste
Management Association

Specialized Training:

OSHA 40-Hour Health & Safety
Training

Mr. Reilly joined C.T. Male Associates in 1993 as an Environmental Engineer. He was subsequently offered and accepted responsibilities as an Owner and Principal, which includes the responsibility of representing the firm at many community and professional functions. In 2012 Mr. Reilly was promoted to Operations Manager of the Environmental Services Division, and was subsequently promoted to Division Manager of Environmental Services and the firm's Director of Operations. Mr. Reilly is responsible for the personnel, production and operations of the Environmental Services Group and for coordinating similar functions within the other Divisions. He manages and supervises a staff of 22 employees consisting of licensed professional engineers, certified geologists/hydro-geologists, industrial hygienists, scientists, and support staff. He is responsible for aligning appropriate staff to accommodate the production demands of many active projects within the Group. He also prepares and reviews proposals, budgets and contract documents, and performs quality reviews of project deliverables.

Mr. Reilly has managed two NYSOGS Term Contracts. Projects under these contracts have included:

- Renovation of a Historic Rest Area Building as the First Taste NY Facility, Todd Hill Rest Area
- Water System Improvements, Bedford Hills Correctional Facility
- WWTP, I684 Rest Area
- Replace Water Main, Clinton Correctional Facility
- Clean Waste Water Treatment Plant Building 44 Lagoons, Green Haven Correctional Facility
- Provide Lead Abatement of Water Storage Tank, Bedford Hill Correctional Facility
- Study to Evaluate Leach Field, Region 1 Duaneburg MSH
- Install Water Meters and Water Meter Pits, Hudson Correctional Facility
- Replace Water Distribution System, Elmira Correctional Facility
- Asbestos, Lead and Bird Dropping Sampling & Design Services, Eastern Correctional Facility

C. T. Male Associates

Kirk Moline, P.G., CEI, CES
Managing Geologist/Principal



Education:

Bachelor of Arts, Geological Science, SUNY Potsdam, Potsdam, NY

Professional Background:

Licensed Professional Geologist – NY

Environmental Assessment Association

- Certified Environmental Inspector
- Certified Environmental Specialist

Professional Affiliations:

Board Member, Town of Wilton Zoning Board of Appeals, 2005-2006

Vice Chair, Town of Wilton Water & Sewer Authority, 2006-Present

Continuing Education:

ASTM 1527-05 Phase I ESA Training and Certification

ASTM Risk Based Corrective Action Certification

Environmental Due Diligence in Real Estate and Commercial Transactions

Principals and Practice of Forced Air Remediation

Groundwater Pollution and Hydrology

REI Site Assessment of Real Estate for Hazardous Waste

OSHA 1910.120 HAZWOPER and Annual 8 Hour Certification

Hazardous Waste Management, Environmental Law, RPI

Mr. Moline has been with C. T. Male for over 20 years serving as a Senior Project Manager/Hydrogeologist. His experience is broad and has primarily focused on hazardous waste and petroleum spill site investigation and remediation, environmental site assessments, and exploration and development of municipal and private water supplies. With the passing of the 1996 NYS Clean Air Clean Water Environmental Bond Act, Mr. Moline has served as the Project Manager on many Environmental Restoration Program Projects, and several Brownfield Cleanup Program project sites. His experience also includes management of over 1,000 environmental site assessments, nearly 200 Phase II environmental site assessments, vapor intrusion assessments solid waste landfill closure hydrogeologic investigations, mineral resource evaluations, geophysical surveying, and expert witness testimony.

Notable Project Experience:

NYSDEC ERP & BCP Projects

- 188 Warburton & 33 Ashburton BCPs, Yonkers, NY
- Former Grand Union BCP, Fort Edward, NY
- Long Energy Site BCP Application, Albany, NY
- 312 Broadway & 314 Clinton Street, Schenectady, NY
- Pan American Tannery, Independent Leather & Risedorph Tannery, Gloversville, NY
- Durkee Street Parking Lot, Plattsburgh, NY
- South Troy Industrial Park, Troy, NY
- 99 North Main Street, 104 & 107 South Main Street, Dolgeville, NY
- 400 Broadway, Saranac Lake, NY
- Former Dix Avenue Drive-In Theater, Kingsbury, NY
- Former CP Rail Yard, Plattsburgh, NY
- South Troy Industrial Park, Troy, NY
- Public School #6, Yonkers, NY

Environmental Site Assessment Phase I & II

- Managed and performed over 3,000 assessments
- Land Reutilization Corp. of the Capital Region – Phase I ESAs & NEPA Reviews
- Albany County Land Bank, Multiple Phase I ESAs
- Petroleum Spill Investigation, Johnstown, NY
- Burgess Terminal, Scotia, NY
- Former YMCA, Saratoga Springs, NY
- Former IGA Supermarket, Greenwich, NY
- Former Texaco Terminal, Bethlehem, NY

C. T. Male Associates

Jeffrey A. Marx, P.E.
Senior Environmental Engineer



Professional Background:

Licensed Professional Engineer in the State of New York

NYSDOL Licensed Asbestos Project Designer

Education:

Bachelor of Science Civil Engineering, Rochester Institute of Technology, Rochester, New York, 1994

Professional Affiliations:

American Society of Civil Engineers, Hudson Mohawk Section, Member

The Practicing Institute of Engineering, Inc., Member and Evaluator

The Foundation for Engineering Education, Inc., Engineers Week Steering Committee

American Foundation for Suicide Prevention Volunteer & Safe Talk Trained

Specialized Training:

OSHA 40-Hour Health & Safety Training

OSHA 10-Hour Construction Safety Training

Mr. Marx joined C.T. Male in 1997 as an environmental engineer. His responsibilities include development and implementation of environmental field investigations for NYS Brownfield, Environmental Restoration and Spills Programs, tank assessment and closures, design of vapor intrusion mitigation systems, various media sampling, hazardous waste sampling, management and disposal, environmental site assessments, remedial system monitoring and QA/QC of the firm's environmental instrumentation. Mr. Marx also prepares Remedial Investigation Reports, Final Engineering Reports, Site Management Plans, Alternative Analysis Reports, Spill Prevention, Control and Countermeasures Plans and Fuel System Assessment Reports, Industrial SPDES Stormwater Pollution Prevention Plans and Best Management Practice Plans. He develops engineering and construction costs estimates, authors and edits technical specifications, observes and manages remedial construction activities and provides environmental compliance assistance for Notice of Violations (NOV).

He is a shareholder in the firm, Chairman of our Technical Specifications Committee, and a member of the Safety Committee.

Mr. Marx enjoys mentoring the younger community through involvement in engineering capstone projects, high school career fairs, Future City, and a local engineer's week event that includes a high school model bridge competition.

Notable Project Experience:

NYSDEC ERP & BCP

- Former Chalmers Knitting Mill ERP, Amsterdam, NY
- USAI Lighting BCP, New Windsor, NY
- Former Grand Union Site BCP, Fort Edward, NY
- 312 Broadway ERP, Schenectady, NY

Phase I & II ESA's, Tank Closures & Remediation

- Golub Corporation, Multiple Sites, Phase I ESAs
- Confidential Site, Buried Drums Assessment & Removal, Malta, NY
- Agri-Mark, Inc. Tank Closure, Chateaugay, NY
- Residence Basement Oil Spill, Averill Park, NY

SPCC, SWPP & BMP Plans, NOV Assistance & PBS Compliance

- Regeneron Environmental Compliance Assistance
- SWM International, ICP/SWPP Plan, Ancram, NY
- GlaxoSmithKline, SWPP Plan and BMP Plan, Durham

Vapor Intrusion Mitigation

- Co-Generation Plant, Rensselaer, NY
- Monument Square, Albany, NY
- Tapestry, Troy, NY

C. T. Male Associates

Nancy E. Garry, P.E., C.S.P.
Senior Environmental Engineer

**Professional Background:**

Licensed Professional Engineer –
New York

Certified Safety Professional

Education:

Master of Arts, Environmental
Engineering, Rensselaer
Polytechnic Institute, Troy, NY

Bachelor of Arts,
Chemistry/Biology, College of St.
Rose, Albany, NY

Professional Affiliations:

NYS Society of Professional
Engineers

Capital District Chapter, NYS
Society of Professional Engineers,
Director 2017-2019

Specialized Training:

OSHA 40-Hour Health & Safety
Training

OSHA 10-Hour Construction
Safety & Health

Ms. Garry joined C.T. Male in 2017 as a Senior Environmental Engineer. She has over 20 years experience in site investigation and remediation projects and environmental compliance. Ms. Garry also has extensive experience in OSHA and environmental, health and safety on-site compliance for industrial and government clients.

Ms. Garry is responsible for projects including Clean Air Act assessments and compliance; Risk Management Plans; chemical and petroleum bulk storage assessments and compliance; environmental audits; Phase 1 & 2 environmental site assessments; and various environmental engineering projects.

Notable Project Experience:**NYSDEC ERP & BCP**

- Former Stevens & Thompson Paper Mill, Greenwich, NY, BCP
- Scolite Site, City of Troy, NY, ERP
- South Troy Waterfront, Troy, NY, NYS BOA (Brownfield Opportunity Assessment)
- Sawmill Place Remediation Area A, B, and C, Walkill, NY, BCP
- Mechanicville Light Industrial Park, City of Mechanicville, NY, ERP
- 37 Commonwealth Drive, Wyandanch, NY, ERP

Ms. Garry has managed a three year NYSOGS and a seven year NYSDEC Term Contract. Projects under these contracts have included:

- Tank design packages for the removal and installation of ASTs for back up fuel sources and fueling stations at numerous Department of Corrections and Community Supervision facilities throughout NYS.
- Three NYSDOT former spills sites that required remediation, ongoing monitoring, and spill closure.
- Managed approx. twenty five projects under the NYSDEC contract that included site characterizations, remedial investigations, feasibility studies, and site management throughout NYS.

**Education:**

Bachelor of Arts, Geology and Geophysics, Concentration in Math, University of Connecticut

Professional Background:

Licensed Professional Geologist, NY

Continuing Education and Certifications:

OSHA 1910.120 HAZWOPER and Annual 8 Hour Certification

OSHA Confined Space Entry Training

OSHA Lockout/Tagout - Control of Hazardous Energy Training

Aquifer Testing for Improved Hydrogeologic Site Characterization Featuring AQTESOLV and In-Situ LevelTROLL, Colorado School of Mines

Certified Hazardous Materials Manager Review, University of Iowa

Mr. Dippert joined C.T. Male in 2007. His duties include soil and groundwater investigations, participation in Phase II Environmental Site Assessments, supervision of staff performance of on-site media sampling, remedial action field oversight, and participation in various other environmental projects. He is responsible for the preparation of all relevant field logs, interpretation of lab data, preparation of technical reports, and data research. Since 2015, Mr. Dippert has been focused full-time on 4 major State and/or Federal PFAS Superfund sites in NY, VT, and NH. This work has involved the implementation of the site characterization work plans and adherence to state's guidance documents.

Notable Project Experience:**Emerging Contaminant Projects**

- 2 Sites, Hoosick Falls, New York
- 1 Site, North Bennington, Vermont
- 1 Site, Merrimack, New Hampshire

NYSDEC ERP & BCP Projects

- 312 Broadway ERP, Schenectady, New York
- 99 West Main Street ERP, Dolgeville, New York
- 1705 Broadway ERP, Schenectady, New York
- 400 Broadway ERP, Saranac Lake, New York
- Public School 6, Yonkers, New York
- 188 Warburton Avenue, Yonkers, New York
- South Troy Industrial Park, Troy, New York
- Former Dix Avenue Drive-In Theater, Kingsbury, New York
- First Prize Center, Albany, New York

Luther Forest Technology Campus, Malta, New York. Mr. Dippert performed a Phase II Environmental Site Assessment for Malta Rocket Fuel Area site located in the Town of Malta, NY.

New York Racing Association, Saratoga Springs, New York. Mr. Dippert provided field oversight services during this groundwater investigation at the Saratoga Race Course located in Saratoga Springs, including pumping well installation, well development and performance of 24 hour yield test.

Former YMCA, Saratoga Springs, New York. Mr. Dippert provided field oversight during this petroleum spill investigation including groundwater and soil sampling.

Experience

Brian has more than 20 years of experience and a master's degree in environmental engineering. His work has involved designing soil- and water-treatment systems and operating remediation systems. Examples of Brian's experience include:

- Serving as project principal for investigation of multiple sites with per- and polyfluoroalkyl substances (PFAS) impacts. Led a team of geologists, hydrogeologists, and groundwater modelers in characterizing the extent, transport, and ultimate remediation of PFAS impacts.
- Serving a project principal for an industrial wastewater bench and pilot study for the removal of PFAS compounds. Led a team of engineers and scientists to develop a phased approach for treatment of a difficult chemical matrix and to ultimately allow for PFAS removal.
- Managing the design of a new groundwater recovery and treatment system for containment and treatment of a sulfolane plume. The system included recovery wells, aeration pond, greensand filter, and granular activated carbon (GAC) vessels. Responsibilities also included operation and monitoring support and regulatory reporting.
- Serving as principal in charge for design and construction management of an air-sparging system to mitigate dissolved phase contaminations at a major Midwestern refining facility.
- Managing the design of modification to an existing groundwater treatment system to remove sulfolane. The design included addition of a sand filter to remove solids and GAC system to remove sulfolane. Responsibilities also included operation and monitoring support and regulatory reporting.
- Managing the design of a full-scale air-sparge pilot-test system to calculate degradation of recalcitrant contaminants.
- Serving as project manager for design of a groundwater treatment system using GAC to remove sulfolane.
- Managing the pilot testing and design of a point-of-entry treatment system using GAC to remove sulfolane.
- Designing and overseeing the contracts for and implementation of soil-and groundwater-remediation systems at a former petroleum-storage and-transport facility. The remediation system included dual-phase recovery; soil-vapor extraction with off-gas treatment; air sparging of groundwater; and water treatment by means of an air stripper. Currently serving as project manager of system operations and maintenance, as well as enhancement of the system, including an air-sparging system.
- Serving as project manager for emergency-response assistance to a large-scale crude-oil pipeline release. Work includes oversight of field activities, groundwater-monitoring program, and remediation-system design.

- Serving as project manager for evaluation of a groundwater-interceptor system at a Midwestern chemical facility. Work included evaluation of system performance through groundwater monitoring and data evaluation.
- Serving as project manager for evaluation and design optimization of an existing groundwater-remediation system at a crude-oil-refining facility.
- Serving as project manager for regulatory closure of a former tank-farm area contaminated with lead-impacted soil. The lead-impacted material was solidified with Portland cement.
- Serving as project manager for investigation and remediation of a soil and groundwater TCE (trichloroethylene) plume. Remediation included soil and groundwater removal, and overall responsibilities included regulatory negotiations.
- Serving as project manager and principal in charge for remediation-systems operation at a major Midwestern refinery. Remediation systems include three soil-vapor extraction systems, two air-sparge systems, and a groundwater-interceptor trench.
- Serving as project manager for the design, installation, and operation of a dual-phase groundwater and soil-vapor recovery system at a major Midwestern refinery.
- Serving as field engineer for stormwater-basin construction, including sewer piping, liner installation, and a contaminant cap.
- Working with a refining company to determine whether the drinking-water system at a Minnesota facility was in compliance with the Safe Drinking Water Act. Presented findings of the study in a report. Also prepared a study that reviewed flows to the client's stormwater ponds.
- Performing and managing a NESHAP sample program for a major Midwestern refinery. Responsibilities included inspecting process piping to determine sample locations.
- Serving as principal in charge for multiple geotechnical investigations at a major Midwestern refining facility.
- Serving as project manager for design and construction oversight for upgrades to a French drain-type collection system at a major Midwestern refinery. Work included installation of a sheet pile wall, a new piping system, and electrical system upgrades.
- Developing plans and specifications for the Suburban Hennepin Regional Park District for redesigning the filtration system for a sand-bottom swimming pond at the Lake Minnetonka Regional Park.
- Serving as a project engineer for a downstream-users study for Devils Lake, North Dakota, for the St. Paul District Corps of Engineers. The study determined the effects on industries and water treatment plants of pumping floodwaters from Devils Lake (whose water contains high levels of dissolved solids) into the Sheyenne River, which ultimately flows into the Red River of the North. Interviewed operators of the water treatment plants to determine the effects that water from Devils Lake would have on their treatment systems; also interviewed representatives from industries drawing

water from the Sheyenne River and Red River to determine the effects that changed water quality would have on their processes.

During graduate school, Brian worked as both a research and teaching assistant. His responsibilities included investigating the formation of disinfection by-products, as well as examining chlorine decay in water-distribution systems.

Brian completed three internships in the environmental department of a Midwestern refinery. His work involved arranging for laboratories to analyze waste in order to determine its characteristics; managing the hazardous-waste pad; and coordinating the proper disposal of refinery wastes. In addition, he monitored the performance of the wastewater treatment facility to help ensure compliance with the refinery's NPDES permits.

- Education** MS, Environmental Engineering, University of Iowa, 1998
BS, Environmental Engineering, Michigan Technological University, 1996
- Registration** Professional Engineer: Iowa, Michigan, Minnesota, New Hampshire, and New York
- Publications** Valentine, R.L., P.J. Vikesland, B.D. Angerman, S.A. Hackett, M. Shoup, and S. Slattenow. 2000. *The Role of the Pipe-Water Interface in the Formation of Disinfection By-Products and the Loss of Disinfectants in Drinking Water*. AWWARF Press: Denver, CO.
- Valentine, R.L., B. Angerman, S. Hackett, P. Vikesland, and S. Slattenow. 1999. Characterization of disinfectant decay and DBP formation in the presence of water distribution system deposits. *Proceedings of the AWWA Water Technology Conference*.

Experience

Sara Ramsden has more than 15 years of experience in environmental engineering and a master's degree in environmental engineering from the University of Minnesota. Sara's experience includes managing contaminated site investigation and remediation projects, including work in site investigations, remedial action coordination, remedial design and operation, and brownfields redevelopment. She specializes in addressing legacy environmental issues at high-profile contaminated sites with multiple stakeholders. Relevant examples of her experience include:

- Serving as project manager and directing work on a wide-ranging, multi-media remedial investigation, feasibility study, and interim response action involving the presence of per- and polyfluoroalkyl substances (PFAS), a sub-set of perfluorinated chemicals (PFCs), at a project in the eastern United States. PFAS has been detected in the public water supply and private wells in the project area. The project involves a complex group of potentially responsible parties working with local, state, and federal regulatory authorities to address PFAS issues across multiple sites located in the same municipality. Extensive soil and groundwater investigations are ongoing in support of federal and state remedial investigation and feasibility study (RI/FS) processes, and interim remedial actions, including groundwater extraction and treatment, are being considered concurrently with the investigation work. Sara and her team conducted PFAS-water-treatment pilot-testing at the site and have evaluated water treatment options, including granular activated carbon and ion exchange. BEC serves as the lead consultant for developing and refining a complex site conceptual model through iterative efforts, including complex groundwater flow modeling. The work has been closely coordinated between the potentially responsible parties and regulatory authorities as they work to address a significant public interest in the project.
- Serving as project manager on a fast-track, complex vapor intrusion investigation and mitigation project in Minnesota for a confidential client since 2010. Assisted with MPCA Superfund staff negotiations to shut down a remedial groundwater pump-out system that had operated for 25 years at the site. Since 2013, the project involved the collection of samples to analyze for the presence of trichloroethene (TCE) including soil gas and groundwater samples from public rights-of-way using direct-push technology, sub-slab soil gas samples from beneath over 300 homes and buildings, and collection of indoor and outdoor air samples from certain buildings. Vapor mitigation systems have been installed in approximately 180 buildings. As part of the sub-slab sampling effort, Sara and her team communicated with property owners and building occupants regarding sampling in the homes or buildings, obtained access agreements, and scheduled sampling appointments. Responsibilities included overall project management, including coordination of up to 50 team members, communications with the client, regulatory agencies, and other project stakeholders, and response action implementation reporting.
- Managing the project team that assists the city of New Brighton with one of the largest and most complex brownfield redevelopments in Minnesota. The redevelopment involves 15 properties in the 90-acre northwest-quadrant area adjoining I-694 and I-35W. The properties include nine petroleum-release sites, a former refinery and Superfund site, two former municipal dumps with landfill gas

concerns, and other concerns related to past solvent and chemical use. Responsibilities included assisting with Phase I site assessments and Phase II investigations, preparing response action plans, coordinating response action field work and monitoring programs, preparing response action implementation reports, and communication with the Minnesota Pollution Control Agency (MPCA) Voluntary Investigation and Cleanup Program (VIC) and the Petroleum Brownfields program.

- Managing the project team that assisted the city of Minneapolis with a groundwater monitoring program during a construction dewatering project on city property that is adjacent to several Superfund sites with chlorinated volatile organic compound (VOC) groundwater impacts. Work included preparation of a groundwater monitoring work plan, coordination of weekly sampling events, and communications with MPCA and Minnesota Department of Health staff.
- Managing a remedial action in support of a redevelopment project at a former dump in Elko New Market, Minnesota by the Scott County Community Development Agency. Project responsibilities included coordination of Phase II investigations and remedial excavation observation; response action plan preparation; Metropolitan Council and Minnesota Department of Employment and Economic Development (DEED) cleanup grant application assistance; and multi-party coordination with the project client, developers, contractors, and the MPCA VIC program. Successfully secured over \$300,000 in cleanup grant funding for the project from the Metropolitan Council and DEED.
- Serving as project manager since 2010 for a former wood-treating Superfund site with complex legacy issues in Fridley, Minnesota. Work includes coordinating groundwater monitoring, preparing biennial monitoring reports, and negotiating and communicating with MPCA Superfund staff. Coordinated several redevelopment projects at the site with current property owners and with Metropolitan Council Environmental Services (MCES) and their environmental consultant regarding the rehabilitation of a sewer interceptor that runs through the site.
- Serving as project manager for assisting the city of Inver Grove Heights, Minnesota, with environmental concerns encountered during road construction. Work included review of Phase I site assessments, coordination of Phase II investigations and construction observation, and response action plan preparation. Coordinated with MnDOT, MPCA, and civil engineering consultant.
- Performing Phase I environmental assessments and serving as an environmental professional (according to ASTM procedures and standards) at a variety of properties. Numerous ASTM Phase I assessments have included single and multi-parcel industrial and commercial properties in Iowa, Minnesota, North Dakota, and Wisconsin.
- Assisting with remedial investigation planning at a former sawmill and lumber manufacturing facility with historic releases of hazardous substances, including petroleum products and methane impacts in soil gas in south-central Washington. Work included review of previous investigations reports associated with the site and an adjacent landfill, remedial investigation work plan drafting, and communications with the client and current property owner.

- Assisting with remedial action planning for contaminated soils management at a former wood-treating Superfund site in Brooklyn Center, Minnesota. Tasks included assisting with feasibility studies and response action design and cost estimating.
- Assisting with an area-wide groundwater study in the approximately 230-acre Bassett Creek Valley redevelopment area of Minneapolis for Hennepin County. Responsibilities included conducting limited Phase I site assessments on several sites with extensive environmental investigation and cleanup activities. Also summarized and synthesized soil and groundwater contamination data collected from multiple sites based on a review of MPCA files and other site historical documents. The site summaries were made available to potential developers and the general public via an interactive, GIS-based mapping website.

Education MS, Environmental Engineering, University of Minnesota, 2006
BChE, Chemical Engineering (emphasis: environmental engineering), University of Minnesota, 2002

Registration Professional Engineer: Minnesota, Washington

**Publications/
Presentations**

Sullivan, J.M., Metzger, M., Segroves, L., Ramsden, S. "Life-Cycle Assessment (LCA) for Green and Sustainable Remediation" Poster presentation at Battelle's Third International Symposium on Bioremediation and Sustainable Environmental Technologies: Miami, Florida. May 2015.

"Mitigation Techniques – Classic and New Technologies." Oral presentation at the Minnesota Brownfields Vapor Intrusion Forum: St. Paul, Minnesota. January 2015.

Ramsden, S.J., S. Ghosh, L.J. Bohl, T.M. LaPara. 2010. "Phenotypic and genotypic analysis of bacteria isolated from three municipal wastewater treatment plants on tetracycline-amended and ciprofloxacin-amended growth media." *Journal of Applied Microbiology* 109:5, 1609-1618.

S. Ghosh, S. J. Ramsden, T.M. LaPara. 2009. "The role of anaerobic digestion in controlling the release of tetracycline resistance genes and class 1 integrons from municipal wastewater treatment plants." *Applied Microbiology and Biotechnology* 84:4, 791-796.

"Prevalence, Fate, and Characterization of Antibiotic-Resistant Bacteria in Municipal Wastewater Treatment Plants." Poster presentation at the 2006 ASM General Meeting: Orlando, Florida. May 2006.

"Prevalence, Fate, and Characterization of Antibiotic Resistant Bacteria in Wastewater Treatment Plants." Oral presentation at the ASM North Central Branch Annual Meeting. September 2005.

Experience Terri Olson has more than 30 years of experience working with analytical laboratory data. She is currently a senior consultant whose responsibilities include performing periodic review and auditing of analytical facilities and their procedures; evaluating laboratory data; and reviewing and making improvements to BEC's quality management system, which includes updates to BEC's standard operating procedures for field work and data evaluation and quality management plan. She has considerable experience with the wide variety of regulatory methods used for environmental analyses and has worked with many of the mining analyses. Terri's project work has included:

- Performing Level IV data review on laboratory data, including data involving per- and polyfluoroalkyl substances (PFAS), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, general chemistry, and metals.
- Working directly with state and federal regulatory agencies in developing and revising quality assurance project plans (QAPPs).
- Reviewing sampling and analysis plans, QAPPs, and data evaluation reports.
- Evaluating analytical data under both contract laboratory program (CLP) and non-CLP guidelines.
- Coordinating laboratory analysis and services for air, water, wild rice, soil, and sediment projects.
- Preparing analytical data evaluation reports.
- Developing internal procedures for combining Radium 226 and Radium 228 data.
- Troubleshooting data issues for clients.
- Assisting with the quality management system for a client's National Pollutant Discharge Elimination System (NPDES) laboratory.
- Conducting technical laboratory and field-sampling audits.

While working for another employer, Terri's work experience included:

- Serving as client manager for an analytical laboratory in St. Paul, Minnesota. Responsibilities include:
 - Coordinating client needs and requirements with laboratory capabilities.
 - Setting up projects with information specific to client needs to reduce potential issues when analyzing and reporting.
 - Reviewing QAPPs.
 - Reviewing data within reports and acting on any discrepancies found.
 - Generating laboratory reports and invoices.
- Serving as LIMS manager for an analytical laboratory in St. Paul, Minnesota. Responsibilities include:
 - Setting up analyses and clients using Promium LIMS.

- Training new employees on use of the LIMS for sample receiving, project management, invoicing, and reporting.
- Preparing report, bid, and invoice formats using Crystal Reports.
- Interfacing with vendor to develop and maintain custom EDD formats.
- Training employees on new features within LIMS updates.
- Serving as QA/QC coordinator for an analytical laboratory in St. Paul, Minnesota. Responsibilities include:
 - Implementing ISO 9001:2000 standards.
 - Managing the control of documents and records.
 - Implementing laboratory certifications and accreditations.
 - Assuring documentation and resolution of corrective actions and client complaints.
 - Coordinating proficiency-testing program.
 - Updating and reviewing control limits.
 - Reviewing and revising quality assurance manual.
 - Monitoring and coordinating review of standard operating procedures.
 - Coordinating and conducting internal audits.
 - Coordinating outside auditing processes and providing required follow-up.
 - Developing Excel spreadsheets for calculations and charting.
 - Reviewing and signing various laboratory reports.
 - Training and supervising QA/QC assistants.
 - Conducting training sessions on QA topics.
- Serving as lab administrator for an analytical laboratory in LaCrosse, Wisconsin. Responsibilities included:
 - Implementing and supervising all internal processes necessary from sample receipt to report distribution.
 - Developing standard forms for lab reports and invoices.
 - Responding to client requests for quotes, status, results, and interpretation.
 - Assisting in coordinating and facilitating work of support staff.
- Serving as quality control coordinator and microbiologist for an analytical laboratory in LaCrosse, Wisconsin. Responsibilities included:
 - Reviewing results prior to final submittal to the laboratory director.
 - Tracking analyst qualifications and corrective action statements.
 - Performing internal audits on data.
 - Updating control and warning limits.
 - Creating QC spreadsheets for clients.
 - Serving as liaison for state certification audits.
 - Training and supervising student interns.
 - Analyzing proficiency samples for compliance.

- Developing immunoassay techniques.

Education	BS, Microbiology (minor: Chemistry), University of Wisconsin – LaCrosse, 1984
Training	Emerging Contaminant Spotlight: PFAS (2018) EPA's Revision to the 40 CFR, Part 136 Method Detection Limit (MDL) Procedure (2018) Comparative Review of Analytical Methods for Determination of 1,4-Dioxane (2018) Crucial Conversations (2018) Fundamental Calculations and Data Review for Radiochemistry Analysis (2018) Data Quality: It Starts With You (2017) Closing the PFAS Mass Balance: The Total Oxidizable Precursor (TOP) Assay (2017) Comparative Review of Analytical Methods for the Determination of 1,4-Dioxane (2017) Current Trends in Dioxin Analysis and Data Use (2017) Revision to the 40 CFR, Part 136 Method Detection Limit Procedure (2017) Radiation 101 (2017) Challenges and Solutions for Groundwater Sampling and Analysis at CCR Sites (2016) Introduction to Collecting Quality Vapor Samples (2016) ISO 9001:2015 Key Changes and Transition (2016) The Analysis of Polyfluorinated Alkyl Substances (PFAS) Including PFOS and PFOA (2016) Elements of Analytical Laboratory Data Quality (2015) Mechanics of Project Management (2015) ISO/IEC 17025 Internal Auditor Training & Workshop (2014) ISO/IEC 17025 Measurement Uncertainty Workshop (2014) Understanding Water Chemistry for Practical Application (2013) 40 Hour OSHA HAZWOPER (2012) Internal Auditor Training Instructor for ISO 9001:2008 (2010) Internal Auditor Training Instructor for ISO 9001:2000 (2008) LIMS Management Training (2004) Internal Auditor Training for ISO 9001:2000 (2003)
Affiliations	Minnesota Laboratory Association (2001-2006); Secretary (December 2002-April 2005) Minnesota Rules Advisory Committee (2001-2006) MN-ELAP Advisory Committee (2012) MPCA Laboratory Registration Steering Committee (2012-present) MN-ELAP Assessor Selection Committee (February 2013-December 2014)

FIELDS OF COMPETENCE

- Per- and polyfluoroalkyl substances (PFAS) data validation
- Volatile organic compound (VOC), semivolatile organic compound (SVOC), polychlorinated biphenyl (PCB) Aroclor, and pesticide data validation
- High-resolution PCB congener, dioxins/furans, and pesticide data validation
- Inorganic and wet chemistry data validation
- Laboratory auditing
- Technical liaison among laboratories, industries, and consultants
- SOP preparation and review
- Working knowledge of the following instruments, autosamplers, and data processing software:
 - Varian GC-ECD 3800
 - Bruker GC-ECD 450
 - Agilent GC-ECD 6890/7890
 - PAL LEAP autosamplers
 - Waters Empower2/Empower3 chromatography data software

CREDENTIALS

B.S., Chemistry, State University of New York,
University at Albany, Albany, New York, 2008.

A.S., Liberal Arts and Associate of Science, State
University of New York, Broome Community
College, Binghamton, New York, 2006.

SUMMARY OF EXPERIENCE

Mr. Acker has 10 years of experience in the field of analytical environmental chemistry; this experience includes performing instrumental analyses for PCBs, organochlorine pesticides, chlorinated herbicides, and diesel range organics according to US EPA methodology and performing laboratory department management duties.

Mr. Acker is currently responsible for performing analytical data validation to determine data quality/usability and compliance with regulatory and client-specific deliverable requirements and for conducting client requested quality assurance/quality control audits of environmental laboratories.

Prior to joining Environmental Standards, Mr. Acker was a laboratory Analyst, then, Department Manager, for a large nationwide analytical laboratory. He was responsible for gas chromatography (GC) analyses of solid, aqueous, tissue, and air samples in accordance with US EPA methods (e.g., 8082, 8081, 8015, and 8151) and preparation of electronic data. He was also responsible for instrument maintenance (preventative and corrective), troubleshooting, and replacement of major GC components (electron capture detectors [ECDs], injectors, and columns).

As Department Manager, Mr. Acker supervised up to 10 laboratory Analysts across two work shifts. He was responsible for coordinating and directing production goals for the department, ordering laboratory supplies and equipment, maintaining and writing SOPs, assisting the quality assurance department, and working with Project Managers to ensure client requirements and expectations were met.

KEY PROJECTS

- Data validator for several large-scale PFAS-driven projects in multiple states nationwide.
- Data validator for various projects including analyses for VOC, SVOC, PCBs, pesticides, inorganics, and multiple wet chemistry analyses.
- Sequentially served as a laboratory Analyst, laboratory Department Manager, data validator, and laboratory Auditor for one of the nation's largest sediment remediation projects - General Electric Company's Hudson River PCB Remedial Action Monitoring Program (RAMP).

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FIELDS OF COMPETENCE

- Analytical and sampling quality assurance procedures.
- Analytical database design.
- Analytical data validation.
- Analytical method development.
- Data Quality Objective development.
- Environmental chemistry.
- Environmental inorganic analysis methods.
- Environmental organic analysis methods.
- Field operations audits.
- Laboratory audits.
- Performance evaluation studies.
- Quality Assurance Project Plan preparation and review.
- Sampling and Analysis Plan preparation and review.

CREDENTIALS

B.S., Environmental Chemistry, SUNY College of Environmental Science and Forestry, Syracuse, New York, Cum Laude, 1983.

A.A.S., Ecology and Environmental Technology, Paul Smith's College of Arts and Science, Paul Smiths, New York, 1981.

CERTIFICATION

Certified Environmental Analytical Chemist (CEAC) -
#2507 National Registry of Certified Chemists (NRCC), Washington, DC.

PROFESSIONAL AFFILIATIONS

American Chemical Society (Philadelphia Local Chapter)
American Institute of Chemists - Fellow (FAIC)
Water Environment Federation
Society of Environmental Toxicology and Chemistry
American Water Works Association Standard Methods Committee
Past President and Member of the Board of Directors of the National Registry of Certified Chemists (NRCC) (2009 – 2018)

SPECIALIZED TRAINING

US EPA TSCA Good Laboratory Practice Standards,
40 CFR Part 792, February 2005.
Target Software Fundamentals, Thermo LabSystems, February 2000.

SUMMARY OF EXPERIENCE

Mr. Blye has more than 36 years of diversified experience in the field of environmental chemistry; his experience includes field data collection and environmental sampling and the planning, development, and execution of field sampling and analytical projects. He specializes in the interpretation of organic and inorganic analysis data and the development of field procedures for the collection of representative groundwater, surface water, soil, air, and multi-media samples. He has generated site-specific sampling plans for more than 200 sites, including Quality Assurance Project Plans (QAPjPs) for more than 47 state or federally supervised CERCLA, RCRA, and DoD sites.

Mr. Blye has extensive experience in US EPA organic and inorganic analytical methodology and analytical data validation. He has validated data analyzed according to 40 CFR Part 136 requirements (100-1600 Series), drinking water regulations (500 Series), RCRA requirements (SW-846), and CERCLA/SARA requirements (Contract Laboratory Program [CLP] Statements of Work [SOWs]) and has overseen the validation efforts of several hundred projects. He has



developed internal and external training programs to teach data validation procedures according to US EPA requirements.

Mr. Blye also has extensive experience in auditing laboratory facilities to evaluate compliance with analytical protocols and QAPjPs and to determine capabilities. He has audited more than 400 laboratories, 15 of which were participants in the CLP. He has also audited several laboratories in Canada, the United Kingdom, Europe, and Puerto Rico.

He is familiar with data management procedures for storing, retrieving, and reporting field and analytical data. He has worked closely with several laboratories to identify specifications for electronic delivery of analysis results to facilitate database management. He also has developed logic for both commercially available and project-specific electronic data verification tools.

Prior to joining Environmental Standards in 1992, Mr. Blye was Quality Assurance Manager for a nationally affiliated environmental consulting firm. He was responsible for directing laboratory subcontractor analytical services, special analytical projects, field and laboratory quality assurance/quality control (QA/QC) programs, and analytical data validation services. He managed and directed a staff of 11 quality assurance chemists whose primary duties were field quality assurance procedure development, analytical data management, and analytical data validation.

KEY PROJECTS

- QA Program Manager for General Electric Company's Hudson River PCBs Superfund Site Sediment Sampling and Analysis Program (SSAP). This project is one of the nation's largest sediment remediation projects. The SSAP consists of collection and analysis of over 55,000 sediment samples to support the design of the dredging needed to remove PCB-contaminated sediment from the Upper Hudson River. The multi-year sediment sampling program began in the fall of 2002 and resumed during the summer and fall of 2003, 2004, and 2005. Mr. Blye assisted General Electric Company in developing the SSAP Quality Assurance Project Plan and implementation of the QA program including the rigorous

Performance Evaluation (PE) sample program, electronic data verification, data validation and information management. Environmental Standards was responsible for the analytical data management tasks for the SSAP. Project-specific Electronic Data Deliverables (EDDs) and a custom Oracle® platform database were implemented for the data management system. Mr. Blye directed Environmental Standards' activities associated with laboratory procurement for the SSAP analytical needs. He managed oversight of the nine contract laboratories used during the SSAP. Mr. Blye and Environmental Standards continue to support General Electric Company's efforts for the Baseline Monitoring Program, engineering design, and Remedial Action Monitoring Program (RAMP). During the Phase I dredging project conducted in 2009 and the Phase 2 dredging project conducted from 2010 to 2016, Mr. Blye served as the Quality Assurance Program Manager for the RAMP. The project is advancing to Operations, Maintenance and Monitoring (OMM) and Mr. Blye continues to support the long-term monitoring activities.

- Project Director for several site investigations focused on per- and polyfluoroalkyl substances (PFAS) in various matrices, including sites in New York, New Hampshire, Vermont, Michigan, New Jersey, West Virginia, and Ohio. Responsibilities include overseeing the data validation efforts, coordination with the various lead and data management consultants, and providing chemistry consulting on an as needed basis. Efforts include development of the protocols to review the PFAS data from multiple laboratories, as many of the analyses were performed by laboratory-specific techniques. Assisted in the improvement of the laboratory techniques and troubleshooting for unexpected results and new matrices. The projects have included aggressive schedules, training internal and external Chemists to review the data, and working with the project laboratories to resolve various errors.
- Conducted laboratory audits from 2011 to 2016 of seven commercial laboratories in the U.S and Canada performing PFOA analysis for a major chemical manufacturer.

KEY PROJECTS (Continued)

- Served as part of the Project Team that critically reviewed and commented on SW-846 Method 8327 for preparation and analysis of PFAS analytes.
- Retained by the Delaware Estuary TMDL (Total Maximum Daily Load) Coalition (the Coalition) to provide expert analytical consulting services regarding the Delaware Estuary Stage 2 PCB TMDL. The Coalition is a group of 12 companies working with the Delaware River Basin Commission (DRBC) on scientific and technical issues associated with the PCB TMDLs. Mr. Blye represents the Coalition as a member of the Data Quality Subcommittee (DQSC) that assists the TMDL Technical Advisory Committee (TAC). In this capacity, Mr. Blye assisted in developing detailed analytical and sampling Data Quality Objectives (DQOs) for collection and analysis of samples to be collected during the Stage 2 PCB TMDL study. Mr. Blye provided particular expertise in the analysis of samples according to draft US EPA Method 1668A - Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS. Environmental Standards also assisted the Coalition members in procurement of analytical services to conduct the US EPA Method 1668A (modified for the DRBC) analysis for their point source discharge outfalls, coordinating the analytical work, and validating the HRGC/HRMS congener analysis data. Environmental Standards also prepared the analytical deliverables according to DRBC requirements for submission by the Coalition members to the DRBC.
- Project Director for a major fuel oxygenates investigation in the Charnock Well Field, Santa Monica, California. Provided overall quality assurance support to the client, a major oil company, and its lead consultant. Environmental Standards validated over 3,000 soil, groundwater, and vapor samples that were analyzed for BTEX, fuel oxygenates, and TPHg. The project required extensive coordination with the client, the client's outside counsel, the lead consultant, and multiple laboratories to identify and correct problems and to maintain consistency in reporting of data. The project was completed successfully under an extremely aggressive schedule. Environmental Standards assisted in data management aspects of the project, which included providing edited electronic data deliverables (EDDs) with the validated data to the lead consultant and preparing edited EDDs of the unvalidated data to make these data consistent with the validated data. Several customized reports were prepared to express the validated data. Mr. Blye also participated in preparation of the investigation report.
- Project Director for development of Quality Assurance Project Plans (QAPPs) for the two Enforceable Consent Orders (ECAs) to conduct Laboratory Scale Incineration Testing of Fluoropolymers and Fluorotelomers. The purpose of the overall testing program was to assess the potential for fluoropolymers and fluorotelomers to emit perfluorooctanoic acid (PFOA) during laboratory-scale combustion testing under conditions representative of typical municipal waste combustor operation in the United States. The QAPPs were required under the ECAs to comply with US EPA's Good Laboratory Practices (GLP) under Section 792 of the TSCA regulations and to be prepared in accordance with US EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5), marrying two distinct QA programs into one QAPP.
- Senior Chemist that directed the technical support to various private industrial clients and coalitions (the Utility Water Act Group, the Federal Water Quality Coalition, and National Association of Clean Water Agencies), as related to the proposed approval of US EPA Method 1668C (Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS) in the *Code of Federal Regulations* (CFR). Support included meeting with US EPA to discuss concerns related to approval of the method and the generation of a detailed critique of the method, various inter-laboratory studies, peer review, and other supporting documentation. The critique was submitted to the docket by the various clients during the public comment period. The US EPA has currently deferred action on Method 1668C based on these submittals.

KEY PROJECTS (Continued)

- Served as Project Director for Vinyl Chloride Producers (VCP) Group, which represented a total of 13 manufacturing locations. VCP Group required the services of a seasoned data validation expert for dioxin/furans by US EPA Method 1613B, as it needed to include alternative sample preparation and analytical technique variations. According to the method, the concentration of 2378-TCDF must be confirmed on a second, more polar GC column due to potential interferences with non-2378 TCDF-congeners on the commonly used GC columns. For the client's PCDF source using the GC column in the US EPA method analysis, the bias for other 2378-substituted PCDF-congeners can also be high. For this project, the confirmation analysis was extended to all *tetra*- through *hexa*-CDD/F. The project included assisting with finalization of sampling and analytical QA guidance, training sessions for VCP Group participants, reviewing/validating initial laboratory QA qualification results to confirm adequate performance by laboratories participating in the project using an artificial QA/QC sample, and data validation for each individual group member.
- Reviewed a major chemical manufacturing company's in-house research laboratory's procedure for preparation and analysis for a perfluorochemical (PFC) in treated and untreated article-of-commerce samples; this review was part of the overall effort by the company to address the increasing number of independent studies on the toxicity and environmental occurrence of PFCs. Reviewed the resulting data under a very "tight" schedule to allow its presentation at a public forum. All of the article-of-commerce samples were extracted, and the resulting supernatants were analyzed for PFC using a high-performance liquid chromatography tandem mass spectrometry (HPLC MS/MS) technique. The data were presented in the form of an Analyst's logbook that included sample analysis instrument raw data, standard and QC raw data, and notes documenting the procedures performed. Corrected the miscalculated values and identified both qualitative and quantitative

issues that impacted the data. The client expressed appreciation of Environmental Standards' help and flexibility with the data analysis and recognized Environmental Standards' capabilities relative to the quality of the work and working within stringent project schedules. Served as Project Manager as part of the company's on-going consent order-driven groundwater investigation to determine if there had been any impact on human health and the environment resulting from releases of PFCs into the environment; evaluated contracted research laboratory's QA/QC procedures and data extraction technique and HPLC MS/MS analytical method for regulatory and data review purposes. Made several recommendations to make the data more consistent with the QA/QC and deliverable requirements for US EPA methods using similar technology. Provided oversight of the critical third-party review of the HPLC MS/MS analytical method.

- Project Director for Region I corrective action program (CAP) RCRA Facility Investigation (RFI) for an aerospace manufacturing facility in Connecticut. The project required assisting the client in the identification and selection of two qualified laboratories to provide an estimated \$7M in analytical services over the duration of the RCRA RFI. Developed an analytical services request for proposal (RFP), reviewed the bidders' proposals, interviewed the qualified candidates, and provided award recommendations to the client. Directed the preparation of project-specific Appendix IX analytical standard operating procedures (SOPs) to ensure data comparability for SW-846 methods between the two contracted laboratories. Prepared data validation SOPs for validation of the Appendix IX analytical data. Directed field audits of two primary engineering/environmental consultants to provide the client with an indication of the consultants' field QC procedures. Directed QC oversight of the initial soil-gas study investigation, including auditing the subcontractor soil-gas analysis laboratory. Directed validation activities for initial soil boring program and ICM study consisting of approximately 550 Appendix IX volatile and semivolatile organic sample analyses, 300 Appendix IX metals sample analyses, 60



KEY PROJECTS (Cont.)

- dioxin/dibenzofuran sample analyses, 60 Appendix IX pesticide/PCB sample analyses, and 17 complete Appendix IX sample analyses. Prepared the Data Collection Quality Assurance Plan for the RFI. Validation activities required direct editing of the project database via remote-access software applications. SQL statements have been prepared to assist in transfer of data from unqualified to qualified state. Analytical data for approximately 1,000 soil, groundwater, surface water, and sediment samples were validated during the remainder of the Phase I RFI. A comprehensive Data Quality Assessment report that summarized all QA/QC oversight, auditing, and validation activities was prepared at the conclusion of the Phase I RFI.
- Project Director responsible for providing quality assurance support to the corporate remediation group of a Fortune 10 client; provides budget oversight, technical direction, and staff management for all projects for this client. Environmental Standards is this client's preferred consultant to provide data validation, data management, and quality assurance plan preparation services.
 - Laboratory audit team leader responsible for auditing five laboratories in the Midwest under consideration for selection as a primary Tier I analytical supplier for an automotive manufacturer. Responsible for coordinating audit report production and providing senior technical review.
 - Laboratory audit team leader responsible for auditing six laboratories on the East Coast that participated in a Fortune 100 client laboratory program. Audits were conducted to satisfy the client's laboratory certification program requirements.
 - Evaluated the impact of volatile organic compound contamination originating from a National Priority List (NPL) site on 25 residential wells in the vicinity of the site. Assisted in design engineering, installation, and monitoring point-of-entry treatment systems selected as contaminant remediation.
 - Performed analytical data validation for numerous site investigations to determine analytical data outliers and data quality/usability.
 - Prepared, documented, and implemented QAPjPs for numerous state and federally led site investigations (CERCLA, RCRA, ECRA, DoD, USATHAMA, and NEESA).
 - Evaluated the validity of analytical data collected for use in the Hazard Ranking Score for selection of a Pennsylvania site for the NPL. The primary issue concerned the use of soil-gas analyses performed using a field portable gas chromatograph (GC).
 - Interpreted volatile organic analytical data to identify the existence or potential existence of biological degradation of volatile compounds for several Pennsylvania and New Jersey site investigations.
 - Developed a field methanol extraction procedure for soil samples (in 1987) to yield a more accurate collection of volatile organic compound data and to assist in defining background conditions prior to the start-up of site remediation. The methanol extract was analyzed following the CLP medium-level volatile protocol. This technique has now become a preferred sampling procedure for VOCs (SW-846 Method 5035).
 - Laboratory audit team member responsible for auditing five United Kingdom laboratories under evaluation by two Fortune 100 clients.
 - Developed field soil-gas survey procedures to monitor for volatile organic compounds using both organic vapor analyzers and portable GCs. Managed several soil-gas surveys for clients as a means to inexpensively evaluate site background conditions and to cost-effectively implement traditional investigation methods.
 - Directed analytical subcontract services (in excess of \$2.5M annually) for a major environmental consulting firm. Responsible for all contracting, price negotiations, and performance audits.



KEY PROJECTS (Cont.)

- Prepared a QAPjP for a large multi-national company to specify QA/QC requirements during the development of an Environmental Impact Statement (EIS) in Spain. A United Kingdom-based laboratory was audited and procedures were developed for the laboratory to conform to US EPA analytical procedures. The successful completion of the analytical program required significant coordination with the project team and laboratory.
- Prepared a QAPjP for a large multi-national company to specify QA/QC requirements for a field investigation conducted in support of a Feasibility Study at a PCB chemical manufacturing facility in Wales, United Kingdom. Specific analytical requirements were developed to allow the United Kingdom-based laboratory to comply closely with US EPA analytical procedures.
- Developed analytical requirements for the analysis of propylene glycol, ethanol, and glycerine in support of a stack emission test sampling program for a major tobacco processing company.
- Provided sampling and analytical oversight services to an insurance adjuster relative to contaminant remediation of tenant property due to a major high-rise fire in Philadelphia, Pennsylvania. Fire soot was found to be contaminated with dioxins and PCBs.
- Developed a strict groundwater, surface water, and soil monitoring and analytical program to comply with a New Jersey State Administrative Consent Order for a major chemical manufacturer. Over 125 groundwater samples were collected on an annual basis and monitored for various volatile organic compounds, total phenols, and cumene. Sampling and analytical programs were developed to collect data necessary for a multi-discipline project team to assess potential risk at the site and to develop remedial measures.
- Provided "turnkey" analytical services for a large chemical manufacturer according to state permit conditions during the installation of a deep injection well at a phenol/acetone production

plant. The analytical data subsequently indicated phenol to be present at a depth of approximately 3,000 feet. The client was identified by the state regulatory agency as the potentially responsible party for the contamination. Reviewed and validated the complex organic and inorganic data collected from the injection well formation fluids for use by various technical experts and attorneys; provided expertise in the analysis of environmental samples for use in the litigation.

- Provided analytical data validation services and litigation support to a West Virginia law firm. The law firm's client was charged with criminal felony by the US Attorney General for alleged illegal disposal of a RCRA hazardous waste. Reviewed the extraction procedure (EP) toxicity analysis data generated by the state of West Virginia for adherence to proper protocol and evaluated the sample collection procedures used.

PUBLICATIONS/PRESENTATIONS

Blye, D.R., "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-Drinking Water Samples." EBC Rhode Island Emerging Contaminants Program Understanding the Science and Toxicity of PFAS – A Deeper Dive. Providence, RI. October 22, 2019

Blye, D.R., "Analytical Methods and Challenges Associated with Per- and Polyfluoroalkyl Substances." Lower Susquehanna Source Water Protection Partnership Meeting. Harrisburg, PA. October 2, 2019

Blye, D.R., "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-Drinking Water Samples." Eurofins PFAS Seminar. Philadelphia, PA. September 19, 2019.

Blye, D.R., "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-Drinking Water Samples." Eurofins PFAS Seminar. Needham, MA. May 30, 2019.

PUBLICATIONS/PRESENTATIONS (Cont.)

Blye, D.R., Michell Meg. A, "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-Drinking Water Samples." Shealy PFAS Workshop. Cary, NC. March 29, 2019.

Blye, D.R., Gratson, David A., Vitale, Rock J., Michell, Meg A., "Which Method Should/Did You Use for PFAS?" AEHS 29th Annual International Conference. March 6, 2019

Blye, D.R., Gratson, David A., Vitale, Rock J., Michell, Meg A., "Making Sense of PFAS Methods." 15th Annual Environmental Professionals of Arizona Conference. March 6, 2019

Blye, D.R., "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-Drinking Water Samples." Lunch and Learn: PFAS Sampling and Analysis. Ypsilanti, MI & Kentwood, MI. November 14-15, 2018.

Blye, D.R., Vitale, R., "Laboratory and Field Practices That Seemed Like a Good Idea at the Time." Texas Commission on Environmental Quality. Austin, TX. May 15, 2018.

Blye, D.R. "Analytical Methods & Challenges Associated with Polyfluoroalkyl Substances (PFAS)" SGS PFAS Sampling & Analysis Lunch & Learn, New Brunswick NJ, December 13, 2017.

Blye, D.R. "Analytical Methods & Challenges Associated with Polyfluoroalkyl Substances (PFASs)". Association of Environmental Engineering Geologists (AEG) Annual Meeting. Colorado Springs, CO. September 14, 2017.

Blye, D.R. "Analytical Methods & Challenges Associated with Polyfluoroalkyl Substances (PFASs)." Mid-Atlantic PPCP/CECs Workgroup Membership. September 7, 2017.

Blye, D.R. "Analytical Methods & Challenges Associated with Polyfluoroalkyl Substances (PFASs)." American Institute of Professional

Geologists. New Cumberland, PA. April 21, 2017.

Blye, D.R. "Analytical Methods & Challenges Associated with Polyfluoroalkyl Substances (PFAS)" American Institute of Professional Geologists Spring Conference: Emerging Contaminants, New Cumberland, PA. April 20, 2017.

Blye, D.R. "Critical Evaluation of Laboratory Data." AWMA West Michigan Chapter. Grand Rapids, MI. April 28, 2016.

Blye, D.R. "Using PCB Congener Data to Evaluate Toxicity Changes in Transformer Fluids". SGS Ultratrace Workshop. Wilmington, NC. April 29, 2015.

Blye, D.R., N.Goodman, J. Hart, M. Michell, A. Tordini, B. Vining, Y. Tondeur. "PCB Congeners in Used Transformer Fluids: A Comparison of Aroclor TEQs from Three Studies". 34th International Symposium on Haogenated Persistent Organic Pollutants. Madrid, Spain. August 31 – September 5, 2014.

Thal, D. I., D. R. Blye, R. J. Vitale, R. L. Forman. "Practical Research Design for Site-Specific Biota-Sediment Accumulation Factors." 31st International Symposium on Halogenated Persistent Organic Pollutants – Dioxin 2011, Brussels, Belgium, August 21-25, 2011.

Thal, D. I., D. R. Blye, R. J. Vitale, R. L. Forman. "Guidance for GC/MS Analysis in Support of Oil Spill Forensics." 31st International Symposium on Halogenated Persistent Organic Pollutants – Dioxin 2011, Brussels, Belgium, August 21-25, 2011.

Blye, David R.. "EPA Method 1668ABC Status and Use in TMDLs." 22nd Annual Environment Virginia Symposium. April 7, 2011.

PUBLICATIONS/PRESENTATIONS (Cont.)

Blye, David R., M. Michell, and R. Gibson.

"Performance Evaluation Sample Program for Hudson River PCB Site Sediment and Remedial Action Monitoring Programs." National Environmental Monitoring Conference. Washington, DC, August 10, 2010.

Blye, David R. "EPA Method 1668A Interlaboratory Study and Data Comparability Evaluation." The Battelle Remediation of Contaminated Sediments Conference. Jacksonville, FL, 2009.

Blye, David R., Julio A. Zimbron. "Interlaboratory Study on PCB Analysis of Natural Waters by Method 1668A." The 23rd Annual Conference on Soils, Sediments, and Water. University of Massachusetts at Amherst, 2007.

Blye, D. R. "New Jersey Monitoring and PMP for PCBs – Sampling and Analytical Summary." NJ Society of Women Environmental Professional (SWEP) Luncheon Program. Princeton Plasma Physics Laboratory. Princeton, NJ, November 30, 2006.

Blye, D. R. and J. A. Zimbron. "Interlaboratory Study on PCB Analysis of Natural Waters by Method 1668A." Presented at the SETAC North America 28th Annual Meeting. Milwaukee, WI, November 12, 2007.

Blye, D. R. and J. A. Zimbron. "Interlaboratory Study on PCB Analysis of Natural Waters by Method 1668A." Presented at the 23rd Annual International Conference on Contaminated Soils, Sediments, and Water. Amherst, MA, October 17, 2007.

Blye, D. R. "Analytical Considerations For Applying EPA Method 1668A For PCB Analysis On Soil And Sediment Investigations." Presented at the 22nd Annual International Conference on Contaminated Soils, Sediments, and Water. Amherst, MA, October 17, 2006.

Blye, D. R. "A Brief Update on the Regulatory Status of EPA Draft Method 1668A for PCBs And Compounds of Emerging Concern."

Sediment Management Working Group (SMWG) Sponsor Forum. Nashville, TN, September 27, 2006.

Blye, D. R. "Analytical Considerations For Applying EPA Method 1668A For PCB Analysis On Soil And Sediment Investigations." Presented at the Hudson/Delaware Chapter of SETAC 22nd Annual Spring Meeting. West Chester, PA, May 4, 2006.

Blye, D. R. and R. J. Vitale. "Performance-Based Measurement Systems: A Double Edged Sword - Buyer Beware." Presented at the 22nd Annual National Environmental Monitoring Conference. Arlington, VA, August 28-31, 2006.

Lancaster, D. J., D. R. Blye, R. J. Vitale, and R. L. Forman. "Method Detection Limits: A Data User's Perspective." 21st Annual National Environmental Monitoring Conference. July 2005.

Zeiner, S. T., D. R. Blye, and R. L. Forman. "Application of Electronic Data Verification With Data Validation To Site Characterization Projects to Maximize Efforts." 21st Annual National Environmental Monitoring Conference. July 2005.

Sandeen, L. R., J. D. Wetherington, D. R. Blye, and R. Sankarmanchi. "Application of the DQO Process to the Delaware Estuary PCB TMDL Program." Water Environment Federation TMDL 2005 Conference. Philadelphia, PA, June 26-29, 2005.

Blye, D. R. "PCB Analysis by EPA Method 1668A." Point Source Discharger Sampling Workshop for the DRBC Stage 2 PCB TMDL. Camden, NJ, January 11 and 12, 2005.

Zeiner, S. T., D. J. Lancaster, D. R. Blye, and J. N. Schott. "Evaluating Calibration Model Reliability." National Environmental Monitoring Conference. Washington, DC, July 19-23, 2004.



PUBLICATIONS/PRESENTATIONS (Cont.)

Blye, D. R., R. J. Vitale, and R. L. Forman. "Forensic Electronic File Review." 19th Annual International Conference on Contaminated Soils, Sediments, and Water. Amherst, MA, October 20-23, 2003.

Blye, D. R. "Trivializing Environmental Data Validation and Auditing An On-Site Analytical Facility." Severn Trent Laboratories 2nd Annual Louisville Meeting. June 5 and 6, 2001.

Blye, D. R. and R. J. Vitale. "Trivializing Environmental Data Validation." American Institute of Chemists 76th National Meeting. Alexandria, Virginia, June 1-3, 2000.

Blye, D. R. EPA & GIES Performance Based Measurement Systems (PBMS) Workshop. Philadelphia, PA, May 6, 1999.

Blye, D. R. and M. A. Clark. "Lowering the Cost of Environmental Risk." Olin Corporation. Charleston, TN, March 27, 1998.

Blye, D. R. "Comparison of Acid Volatile Sulfide/Simultaneously Extracted Metals and Total Metals Analysis Results." The Chemist (September/October 1997).

Blye, D. R. "Environmental Data Validation." Merck & Co., Inc. Somerset, NJ, 1997.

Blye, D. R. "Environmental Data Validation." Merck, Sharpe & Dohme Quimica De Puerto Rico. Barcelona, PR, September 22, 1997.

Blye, D. R. and R. J. Vitale. "General Electric Waste and Wastewater Sampling and Analytical Issues Workshop." General Electric Company, Toronto, Canada, September 19, 1997.

Blye, D. R. "Supplier Beware - Understanding the Needs of Laboratory Clients in a Competitive Market." Water Environment Laboratory Solutions (October/November 1996).

Blye, D. R. "Analytical Buyers - Understanding Their Needs and Responding to Them." Water Environment Federation Preconference

Workshop - Quality Based Laboratory Performance. Norfolk, VA, May 14, 1996.

Blye, D. R. and R. J. Vitale. "The Cost of Quality Environmental Analyses." Pennsylvania's Environment (March 1996).

Blye, D. R. "Toxicity Characteristics Leaching Procedure, An Industry Perspective." TCLP Seminar sponsored by the New York Association of Approved Environmental Laboratories and the US EPA. Uniondale, NY, September 13, 1995.

Vitale, R. J. and D. R. Blye. "Selecting an Environmental Laboratory." Environmental Laboratories: Testing the Waters, Water Environment Federation. Cincinnati, OH, August 13-16, 1995.

Blye, D. R. and R. J. Vitale. "Data Quality - Assessment of Data Usability Versus Analytical Method Compliance." Eleventh Annual Waste Testing & Quality Assurance Symposium. Washington, DC, July 23-28, 1995.

Blye, D. R. "Toxicity Characteristics Leaching Procedure, An Industry Perspective." US EPA Region III Enforcement Training Course. Philadelphia, PA, June 14, 1995.

Blye, D. R. and R. J. Vitale. "Environmental Data Quality Assurance Seminar." Phillips Petroleum Corporation. Bartlesville, OK, May 24, 1995.

Blye, D. R. and R. J. Vitale. "Environmental Data Quality Assurance Seminar." Ford Motor Co. Dearborn, MI, May 18, 1995.

Blye, D. R. and R. J. Vitale. "Environmental Data Quality Assurance Seminar." Exxon Biomedical Sciences, Inc. East Millstone, NJ, January 24-25, 1995.

Piccone, M. J. and M. A. Clark. Presented by D.R. Blye. "Regional Variations in the Evaluation of Analytical Data." SUPERFUND XV. Washington, DC, November 29 - December 1, 1994.



PUBLICATIONS/PRESENTATIONS (Cont.)

Blye, D. R. and R. J. Vitale. "Environmental Data Quality Assurance Seminar." Amoco Oil Company. Chicago, IL, May 13, 1993.

Blye, D. R. "Sampling and Analytical Quality Assurance." Allied Bendix Co., 1987.

Choper, K. and D. R. Blye. "Point of Entry Systems for Removal of VOCs." American Society of Civil Engineers Environmental Engineering Specialty Conference. Orlando, FL, July 1987.

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FIELDS OF COMPETENCE

- Per- and polyfluoroalkyl substances (PFAS) data validation
- Volatile, pesticide/polychlorinated biphenyl (PCB), and semivolatile organic data validation
- Inorganic and wet chemistry data validation
- Radiochemistry data validation
- Laboratory auditing
- Laboratory coordination
- Technical liaison among laboratories, industries, and consultants
- Various methods of analytical chemistry including, but not limited to: gas chromatography/mass spectrometry (GC/MS), inductively coupled plasma/mass spectrometry (ICP/MS), liquid chromatography/mass spectrometry (LC/MS), ultraviolet visible (UV-Vis) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, and infrared (IR) spectroscopy.

CREDENTIALS

M.S., Chemistry, Villanova University, Villanova, Pennsylvania, 2017

B.S., Chemistry, Lycoming College, Williamsport, Pennsylvania, 2015

SUMMARY OF EXPERIENCE

Mr. Eck joined the Chemistry Quality Assurance (QA) Department in 2017, and he performs analytical data validation and laboratory auditing to determine environmental data quality and usability for numerous project sites. Data reviewed include those for US EPA Contract Laboratory Program (CLP) protocols and SW-846 methods. In addition, he evaluates laboratory data deliverables to determine compliance with method, regulatory, and client-specific/Quality Assurance Project Plan (QAPP) requirements.

Mr. Eck also serves as a Laboratory Coordinator for a major chemical manufacturing company. He is responsible for tracking samples from collection through reporting; managing sample collection, receipt, analysis, and reporting issues; coordinating efforts and managing communications between multiple laboratories; reviewing Chain-of-Custody Records to ensure proper reporting; and creating and reviewing analytical service requests. In addition, he ensures that laboratories perform the analysis and reporting procedures according to client specifications.

Prior to joining Environmental Standards, Mr. Eck was involved in graduate and undergraduate chemistry research. His undergraduate research focused on the examination of molybdenum complexes through IR spectroscopy as well as NMR spectroscopy. In addition, his research included the synthesis and characterization of organic molecules using IR spectroscopy, NMR spectroscopy, and GC/MS. His graduate research focused on the application of a silicon-oxide barrier to degrading polyvinyl chloride, in order to preserve decomposing plastic artwork. The barrier was then characterized using desorption electro-spray ionization/mass spectrometry (DESI/MS), IR spectroscopy, and contact angle. Throughout his collegiate career, Mr. Eck worked as a teaching assistant for various chemistry classes including a non-majors science-in-art class as well as a graduate-level chromatography and mass spectrometry class.

KEY PROJECTS

- Performed analytical data validation interpreting PFAS, volatile organic, pesticide/PCB, semivolatile organic, inorganic, and wet chemistry analyses, and prepared technical QA reports.
- Provided data validation services for various projects to determine data usability and defensibility as well as laboratory compliance with method, regulatory, and project-specific requirements.
- Acted as the main contact between several laboratories and a large chemical manufacturing company and assisted in the coordination of the scheduling, sampling, and delivery of bottleware kits and samples from the field. Also, provided



KEY PROJECTS (cont.)

chemistry communication between the laboratory and client. Served as the day-to-day contact for all issues and communication among the laboratories, the client, and Environmental Standards.

- Audited organic, inorganic, wet chemistry, and radiochemical parameters at multiple environmental laboratories to evaluate compliance with NELAC standards, laboratory standard operating procedures, good laboratory practice, and client-specific or project-specific requirements.

STEVEN J. LENNON
Senior Quality Assurance Chemist I

FIELDS OF COMPETENCE

- Analytical and environmental forensic evaluation
- Theoretical and practical knowledge of all facets of quantitative analysis for organic and inorganic pollutants by published methodologies
- Laboratory program design, execution, and maintenance
- Laboratory auditing
- Performance evaluation (PE) study design and execution
- Project-specific quality assurance (QA) oversight
- Quality Assurance Project Plan (QAPP) and data quality objective preparation and evaluation
- Air sampling using viable and nonviable collection procedures for fungal and other biological analytes
- Air, surface, and bulk sampling using active and passive sample-collection procedures for chemical analytes
- Indoor air quality investigation/design and execution for chemical and biological contamination and assessment of indoor environments
- Microbiological aseptic techniques: clean room protocol, filling of containers with sterile cell culture media, and preparation of liquid media from dry powder components
- Working knowledge of the following instruments, autosamplers, and data processing software:
 - OI Analytical 4560 and Tekmar purge-and-trap sample concentrators

- Hewlett Packard gas chromatograph/mass spectrometer (GC/MS; models: 5970-5973)
- OI Analytical Archon autosampler, OI Analytical 4551 autosampler, Hewlett Packard DMP-16
- RTE-A, Target, Hewlett Packard Chemstation, and Enviroquant

CREDENTIALS

B.S., Environmental Biology/Marine Biology,
Millersville University, Millersville,
Pennsylvania, 1994.

PROFESSIONAL DEVELOPMENT COURSES

"Microorganisms in Indoor Air-Health Complaints, Sampling Strategies & Interpretation." AIHA Conference, 2002.

"Inspection, Testing, and Assessment of Microbial Contaminated Buildings – An Overview." National Asbestos and Environmental Training Institute. (Herman Sabath), 2002.

"Gas Chromatography and Mass Spectral Training." MDL Systems Inc. (Mark A. Ferry), 1999.

"Archon Autosampler Training Course." Professional Technical Services, Ltd. (Scott Wolsing), 1997.

"4460A & 4560 Concentrator Training." OI Analytical, 1995.

"Basic 49 CFR Training Course." Hazardous Materials.com (Roy S. Marshall), 2003.

PROFESSIONAL AFFILIATIONS

Indoor Environmental Standards Organization
(IESO) – Member

American Indoor Air Quality Council
(AmIAQ) – Member



SUMMARY OF EXPERIENCE

Mr. Lennon has 24 years of experience in the field of analytical environmental chemistry; this experience includes performing instrumental analyses for volatile organic compounds according to US EPA methodology and performing laboratory QA and quality control (QC) management duties. Mr. Lennon is currently responsible for performing analytical data validation to determine data quality/usability and compliance with regulatory and client-specific deliverable requirements and conducting client requested QA/QC audits of environmental laboratories.

An experienced indoor air quality investigator, Mr. Lennon has performed sample collection design, sample collection using a variety of methods visual inspection of buildings, and interpretation of laboratory results.

Prior to joining Environmental Standards, Mr. Lennon was a QA Analyst for a large analytical laboratory. He was responsible management and distribution of controlled documents; tracking, scheduling, evaluating, and implementing method detection limit studies for all analytical methods performed; determining new control limits for all analytical methods performed; and performing quarterly reviews of manual integrations performed on all GC and GC/MS instruments. He was also responsible for performing raw data reviews for all analytical methods performed; performing internal audits for all analytical methods; assisting in the preparation for external audits and acting as a guide during the audit if needed; and assisting in developing laboratory responses to external audit finding.

Mr. Lennon was also an Environmental Chemist for a large analytical laboratory. He was responsible for GC/MS analysis of solid and aqueous samples in accordance with US EPA methods (e.g., 8260B, 524.2, and OLM03.2). He was responsible for instrument preventive maintenance and troubleshooting and maintaining the integrity of the computer systems. He demonstrated competence in various US EPA methods by completing quad studies (show reproducibility). He was also responsible for analyzing the PE studies for Method 524.2, Rev. 4.0 and performing method detection limit (MDL) studies.

Mr. Lennon was also previously employed by a small biotechnology company as a production technician. He was responsible for the aseptic filling of bottles and bags with liquid cell culture media. He also facilitated the measuring and formulating of liquid media from dry powder chemical components.

KEY PROJECTS

- Performed analytical data validation for numerous site investigations to determine analytical data outliers and data quality/usability. Data reviewed included those for US EPA Contract Laboratory Program (CLP) protocols, SW-846 Methods, Methods for the Chemical Analysis of Water and Wastes, US EPA Series 200 and 600 Methods, air methodologies, and Method 537.
- Served as Project Manager for an annual laboratory PE study conducted for a major client.
- Served as part of the emergency response team for an oil spill in the Gulf of Mexico. The project included thousands of samples collected and analyzed for a wide variety of analytes. The Project Team coordinated with multiple laboratories, consultants, and governmental agencies to facilitate the collection, submission, analysis, and reporting of the analytical data. The data collected were utilized for forensic analysis of the data and for risk assessments. The data validation effort included both Stage 2A and Stage 4 validation efforts.
- Conducted on-site audits of numerous environmental analytical laboratory facilities. The on-site audits included evaluations of the laboratory's sample login and receipt procedures, organization, sample preparation methods, analytical expertise and method compliance, QA/QC procedures, logbook documentation procedures, data package preparation procedures, and results reporting and review procedures. Co-authored detailed audit reports that included descriptions of the laboratory procedures and recommendations for improvements.



KEY PROJECTS (Continued)

- Served as a Data Validation Task Manager for the numerous site investigations conducted for a major client.
- Designed and conducted an IAQ sample collection at a 25,000-square foot industrial production facility in support of a client request for air sampling due to community and employee air quality concerns from production processes. The single-round sampling event included the collection of air samples using Summa® canisters for collection of volatile organic compounds, XAD-2 resin tubes for collection of semivolatile organic compounds, and tape and swab samples at specific locations for possible mold and fungal identification. The results of the air samples were utilized to assuage concerns and to prove that air quality met local, state, and federal standards.

FIELDS OF COMPETENCE

- Analytical and environmental chemistry
- Rigorous third-party data validation for remedial investigations/feasibility studies (RIs/FSSs), Permit B applications, and remedial field investigations (RFIs)
- Quantitative analysis for organic and inorganic pollutants by published methodologies
- Analytical data validation
- Standard operating procedure (SOP) preparation and review
- Environmental and bio-monitoring analysis methods
- Laboratory auditing
- Quality assurance (QA) oversight of project-specific sampling and analysis
- Technical liaison among laboratories, industries, and consultants
- Sampling and Analysis Plan (SAP) preparation and review
- Project-specific analytical Request for Proposal (RFP) preparation
- Quality Assurance Project Plan (QAPP) preparation and review
- Training and managing data validation staff

CREDENTIALS

M.S., Organic Chemistry, University of Pennsylvania, Philadelphia, Pennsylvania, January 1991.

B.A., Chemistry, Gettysburg College, Gettysburg, Pennsylvania, May 1989.

PROFESSIONAL AFFILIATIONS

American Chemical Society (Philadelphia Local Chapter)
Society of Women Environmental Professionals

SPECIALIZED TRAINING

US EPA TSCA Good Laboratory Practice Standards, 40 CFR Part 792, April 2008 and March 2009.

Radiological, Inorganic, Volatile/Semivolatile, and Pesticide/PCB Data Verification and Validation Training, Lockheed Martin Energy Systems, Inc. Environmental Restoration Data Quality Program, April 1996.

Target Fundamentals, ThermoLabSystems, February 2001.

SUMMARY OF EXPERIENCE

Ms. Michell has over 29 years of analytical/QA experience. As a Senior Technical Chemist, Ms. Michell serves as Project Manager for various projects and specializes in the interpretation of organic and inorganic analysis data and the coordination of analytical programs. Her experience includes the planning, development, and execution of environmental and bio-monitoring sampling and analytical programs. She has reviewed and generated numerous QAPPs and SOPs for field collection, laboratory analysis, and data validation.

Ms. Michell has extensive experience in US EPA organic and inorganic analytical methodology and analytical data validation. She has validated data analyzed according to 40 CFR Part 136 requirements (100-1600 Series), drinking water regulations (500 Series), Resource Conservation and Recovery Act (RCRA) requirements (SW-846), and Comprehensive Environmental Response, Compensation & Liability Act/Superfund Amendments and Reauthorization Act (CERCLA/SARA) requirements (Contract Laboratory Program [CLP] Statements of Work [SOWs]) and has overseen the validation efforts



SUMMARY OF EXPERIENCE (Continued)

for numerous projects. She has also developed internal training programs to teach data validation procedures according to US EPA requirements.

Ms. Michell is also experienced in litigation support, laboratory auditing, preparation of laboratory RFPs and subsequent review of laboratory proposals, and performance evaluation (PE) studies.

Prior to joining Environmental Standards, Ms. Michell worked as a Research Chemist and a graduate Teaching Assistant at the University of Pennsylvania. Ms. Michell's research efforts, which were directed toward the total synthesis of detoxin D₁, allowed her to develop skills in spectroscopic and separation techniques (¹H-NMR, IR, flash column chromatography). As a Teaching Assistant, Ms. Michell was responsible for the oversight of organic laboratory experiments in a classroom environment and grading laboratory experiment reports and examinations. Ms. Michell also performed undergraduate research that involved the synthesis of novel facially capping ligands to prepare models for the binuclear iron purple acid phosphatase. Ms. Michell developed skills in spectroscopic techniques (¹H- and ¹³C-NMR, FT-IR, gas chromatography/mass spectrometry [GC/MS]) while performing this research.

KEY PROJECTS

- Project Manager for a biomonitoring study that involved the analysis of blood, serum, and urine for dioxin/furans, dioxin-like polychlorinated biphenyls (PCBs), metals, and various normalizing parameters. Provided overall QA support to the lead consultant. Participated in the development of the sample-collection SOPs, which involved coordination with the client, lead consultant, Field Team, and nursing staff. Participated in the development of project-specific Chain-of-Custody documentation in order to ensure that the data-collection process was conducted and documented appropriately by the nursing staff collecting the samples. Participated in laboratory selection and coordination. Developed the study QAPP, which included procedures for the collection and analysis of blind intra-laboratory

duplicates, inter-laboratory split samples, and field blanks. Assisted with the coordination of a practice run that included collection of blood and urine from volunteers. Project management duties during the project included coordination between the field and laboratories, coordination with the laboratories to address any analytical or QA issues, tracking of hardcopy and electronic data deliverables, oversight of the validation of the analytical data, coordination of correction of reporting errors with the laboratories, and submission of the finalized data to the lead consultant.

- Project QA/QC Officer for General Electric Company's Hudson River PCBs Superfund Site Sediment Sampling and Analysis Program (SSAP), Baseline Monitoring Program (BMP), and Remedial Action Monitoring Program (RAMP). This project was one of the nation's largest sediment remediation projects. The SSAP consisted of collection and analysis of over 40,000 sediment samples to support the design of the dredging needed to remove PCB-contaminated soils from the Upper Hudson River. The multi-year sediment sampling program began in the fall of 2002 and was ongoing. Assisted General Electric Company in developing the SSAP and BMP QAPPs and implementation of the QA program that included a rigorous performance evaluation (PE) sample program, electronic data verification, data validation, and information management. Continues to support General Electric Company's efforts for the long-term operations, maintenance and monitoring program.
- Project Manager for several site investigations focused on per- and polyfluoroalkyl substances (PFAS) in various matrices, including sites in New York, New Hampshire, Vermont, Michigan, New Jersey, West Virginia, and Ohio. Responsibilities include overseeing the data validation efforts, coordination with the various lead and data management consultants, and providing chemistry consulting on an as needed basis. Efforts include development of the protocols to review the PFAS data from multiple laboratories, as many of the analyses were performed by laboratory-specific techniques. Assisted in the improvement of the laboratory



KEY PROJECTS (Continued)

- techniques and troubleshooting for unexpected results and new matrices. The projects have included aggressive schedules, training internal and external Chemists to review the data, and working with the project laboratories to resolve various errors.
- Served as part of the Project Team that critically reviewed and commented on SW-846 Method 8327 for preparation and analysis of PFAS analytes.
- Provided technical guidance to an Alaskan refinery for analytical and sampling issues related to a chemical that was not currently regulated by the US EPA (sulfolane). The project involved participation in a technical working group composed of the client's consultants as well as various members of the regulating community in order to solve numerous analytical issues due to the unique nature of the chemical of concern, which has been identified in water, soil and vegetables on site and in the residential community. The project involved analytical method development, development of project-specific guidance for data validation and checklists, and quick-turn data investigations whenever sulfolane was detected in treated, private drinking water well samples.
- Provided technical support to various private industrial clients and coalitions (the Utility Water Act Group, the Federal Water Quality Coalition, and National Association of Clean Water Agencies), as related to the proposed approval of US EPA Method 1668C (Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS) in the *Code of Federal Regulations* (CFR). Support included meeting with US EPA to discuss concerns related to approval of the method and the generation of a detailed critique of the method, various inter-laboratory studies, peer review, and other supporting documentation. The critique was submitted to the docket by the various clients during the public comment period. The US EPA has currently deferred action on Method 1668C based on these submittals.
- Served as Data Validation Project Manager for Vinyl Chloride Producers (VCP) Group,

which represented a total of 13 manufacturing locations. VCP Group required the services of a seasoned data validation expert for dioxin/furans by US EPA Method 1613B, as it needed to include alternative sample preparation and analytical technique variations. According to the method, the concentration of 2378-TCDF must be confirmed on a second, more polar GC column due to potential interferences with non-2378 TCDF-congeners on the commonly used GC columns. For the client's PCDF source using the GC column in the US EPA method analysis, the bias for other 2378-substituted PCDF-congeners can also be high. For this project, the confirmation analysis was extended to all *tetra-* through *hexa-*CDD/F. The project included assisting with finalization of sampling and analytical QA guidance, training sessions for VCP Group participants, reviewing/validating initial laboratory QA qualification results to confirm adequate performance by laboratories participating in the project using an artificial QA/QC sample, and data validation for each individual group member.

- Reviewed a major chemical manufacturing company's in-house research laboratory's procedure for preparation and analysis for a perfluorochemical (PFC) in treated and untreated article-of-commerce samples; this review was part of the overall effort by the company to address the increasing number of independent studies on the toxicity and environmental occurrence of PFCs. Reviewed the resulting data under a very "tight" schedule to allow its presentation at a public forum. All of the article-of-commerce samples were extracted, and the resulting supernatants were analyzed for PFC using a high-performance liquid chromatography tandem mass spectrometry (HPLC MS/MS) technique. The data were presented in the form of an Analyst's logbook that included sample analysis instrument raw data, standard and QC raw data, and notes documenting the procedures performed. Corrected the miscalculated values and identified both qualitative and quantitative issues that impacted the data. The client expressed appreciation of Environmental Standards' help and flexibility with the data analysis and recognized Environmental Standards' capabilities relative to the quality



KEY PROJECTS (Continued)

- of the work and working within stringent project schedules. Served as Project Manager as part of the company's on-going consent order-driven groundwater investigation to determine if there had been any impact on human health and the environment resulting from releases of PFCs into the environment; evaluated contracted research laboratory's QA/QC procedures and data extraction technique and HPLC MS/MS analytical method for regulatory and data review purposes. Made several recommendations to make the data more consistent with the QA/QC and deliverable requirements for US EPA methods using similar technology. Provided oversight of the critical third-party review of the HPLC MS/MS analytical method.
- Provided QA support as part of the QA Unit for the laboratory-scale incineration testing of fluoropolymers and fluorotelomers performed under two Enforceable Consent Orders (ECAs). The purpose of the overall testing program is to assess the potential for fluoropolymers and fluorotelomers to emit perfluorooctanoic acid (PFOA) during laboratory-scale combustion testing under conditions representative of typical municipal waste combustor operation in the United States. Reviewed the test substance composite preparation reports, combustion stoichiometry calculations, thermogravimetric analysis data, analytical laboratory data reports, and incineration testing facility bench notes to assess whether these activities were performed in accordance with the procedures described in the QAPP and to identify the technical usability of the data for making decisions pertaining to satisfying the project objectives identified in the QAPP. The data generated under this program were required to comply with US EPA's Good Laboratory Practices (GLP) under Section 792 of the TSCA regulations.
 - Project Manager for a major fuel oxygenates investigation in the Charnock Well Field in Santa Monica, California. Provided overall QA support to the client (a major oil company) and its lead consultant. Environmental Standards validated data for over 3,000 soil, groundwater, and vapor

samples that had been analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), fuel oxygenates, and total petroleum hydrocarbon gasoline (TPHg). Environmental Standards assisted in data management aspects of the project by providing the lead consultant with edited electronic data deliverables (EDDs) with the validated data and by preparing edited EDDs of the unvalidated data to make these data consistent with the validated data. Several customized reports were prepared to express the validated data.

- Performed analytical data validation to determine analytical data outliers and data quality/usability for numerous site investigations. Data reviewed included those for US EPA CLP protocols, SW-846 methods, Methods for the Chemical Analysis of Water and Wastes, and US EPA Series 200, 500, and 600 methods. Evaluated data by rigorous review of hardcopy deliverables as well as review of electronic data using data processing software.
- Data Validation Project Manager for many projects associated with US EPA Region I, Region II, Region III, Region IV, and Region V; New Jersey Department of Environmental Protection; and New York State Department of Environmental Conservation site investigations. Project management duties included logging in and tracking data, providing data validation technical assistance, reviewing QA reports, tracking budgets for data package review, and providing technical assistance to clients. Duties also included advising laboratories relative to data deliverables prior to project initiation, providing feedback to the laboratories to correct reporting errors and to improve ongoing analytical work, and coordinating with the laboratory for the generation of data deliverables after significant time had elapsed since analyses were performed. Provided advice to engineering contractors about data quality concerns and made recommendations for sample bottleware preservation, technical holding times, sample shipment, and field quality control measures. Coordinated shipments of bottleware and environmental samples between the laboratory and the field and provided corrective action recommendations for any problems that developed.



KEY PROJECTS (Continued)

- Assisted in project management and served as Data Validation Task Manager for a QA/QC technical oversight project for a large aircraft manufacturer. Prepared SOPs for laboratory audits, analytical work, data validation of analytical work, preparation of analytical data packages, and preparation of QA reports for this extensive site investigation. In preparing the SOPs, coordination with several analytical laboratories, the data management contractor, and the client was essential. Subsequent data validation was performed for several phases of the investigation according to the requirements of data validation SOPs; this validation included a data quality assessment and a compliance evaluation based on the analytical SOPs. Significant coordination with the data management contractor was required to identify problems in the database and to update the database remotely.
- Performed laboratory audits for several major companies to assess laboratory quality and reliability. As requested by the client, the audits evaluated laboratory personnel's use of GLP, laboratory QA/QC programs, and analytical methods.
- Performed an audit of an on-site industrial laboratory with the primary function of providing analytical support for procedures involved in decommissioning electrical transformers and various other electrical equipment. The laboratory analyzed dielectric oil from the equipment to determine if (and at what concentrations) PCBs were present (based on US EPA guidelines). These analyses were used to categorize equipment for disposal. In addition, the facility collected and analyzed wipe samples from the surface area of scrap parts to ensure low levels of residual PCBs. Prepared an audit report summarizing findings and key recommendations for the client to improve the qualitative and quantitative QA/QC for the analyses performed.
- Prepared, and third-party reviewed, many project-specific QAPPs; the projects included participation in the formulation of project strategy and data quality objectives (DQOs) for submission to federal and state regulatory agencies. Prepared QAPPs based on national and Region V guidance documents. In addition,

addressed comments by regulatory agencies regarding QAPP concerns. Provided project-specific justification for project reporting limits that did not meet regulatory agency requirements. Also, reviewed and revised SAPs.

- Provided consultation on the identification of analytical alternatives to potentially expensive state requirements for analytical work for a site investigation directed by the Virginia Department of Environmental Quality; the state required the use of numerous analytical methods for the analysis of only a few classes of analytes. Developed a multi-tiered decision-tree approach that provided a dramatically less expensive alternative that met the DQOs of the project and that overlapped with some of the requirements of the coinciding RCRA facility investigation. Also, modified the QAPP for the RCRA facility investigation to include the alternative analytical approach.
- Prepared the RFP of analytical services for a monitoring program for a major company. The RFP addressed issues including budget, personnel, experience, instrumentation, and laboratory QA/QC programs. Reviewed proposals submitted by the laboratories in response to the RFP to determine the most qualified applicant. Reviewed and aided in rewriting the project-specific laboratory QAPP originally prepared by the contract laboratory.
- Performed a scientific evaluation of the results from the analyses of fly ash samples to identify the possible sources of waste materials at a landfill. The evaluation included determining which analytes should be considered indigenous to the landfill, grouping these analytes based on chemical structure and industrial processes, and comparing the groupings and individual compounds to the manufacturing processes used by various local industries.
- Prepared and issued a one-page survey to the clients of a laboratory to evaluate the laboratory's performance (in terms of client opinion). The survey responses were compiled and evaluated to determine specific areas in which the laboratory could ultimately improve services to its clients.



KEY PROJECTS (Continued)

- Assisted a laboratory in the application process for certification in the Environmental Laboratory Accreditation Program in the state of California. Obtained and reviewed the application and provided the laboratory with a detailed list of information required to complete the application process. Upon receipt of all necessary information from the laboratory, completed the application and provided final instruction to the laboratory.
- Prepared a Laboratory Practices Manual (LPM) for a major chemical company. The LPM was prepared for use by the client, its primary consultant, client-approved laboratories, and other client-approved contractors for analytical guidance, training, and client-specific requirements. The LPM provided a description of the client's environmental analytical data program organization, general QA/QC guidelines, general analytical guidance, data package deliverable requirements, the data management system, invoice procedures, and data reporting requirements to be used for environmental projects. Extensive coordination with the client and its primary consultant was required to incorporate the client-specific protocols.

PUBLICATIONS/PRESENTATIONS

Blye, D.R. and M. Michell. "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-drinking Water Samples." Shealy Environmental Services, Inc./EQI On-Site PFAS Workshop. West Columbia, SC, March 29, 2019.

Gratson, D.A., R. Vitale, D. Blye, and M. Michell. "Which Method Should/Did You Use for PFAS?" AEHS 29th Annual International Conference. March 21, 2019.

Gratson, D.A., R. Vitale, D. Blye, and M. Michell. "Making Sense of PFAS Methods." 15th Annual Environmental Professionals of Arizona Conference. March 6, 2019.

Zeiner, S.T, M. Michell, and D. Blye. "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-

drinking Water Samples." 34th Annual International Conference on Soils, Sediments, Water, and Energy. Amherst, MA. October 17, 2018.

Blye, D.R, N. Goodman, J. Hart, M. Michell, A. Tordini, B. Vining, Y. Tondeur. "PCB Cogeners in Used Transformer Fluids: A Comparison of Aroclor TEQs from Three Studies." 34th International Symposium on Halogenated Persistent Organic Pollutants. Madrid, Spain. August 31- September 5, 2014.

Vitale, R.J., M.A. Michell, L. Dupes. "Development of an Analytical Method for Sulfolane in Various Matrices: A Collaborative Effort Case Study." 29th Annual International Conference on Soils, Sediments, Water, and Energy. Amherst, MA. October 21-24, 2013.

Blye, David R., M. Michell, and R. Gibson. "Performance Evaluation Sample Program for Hudson River PCB Site Sediment and Remedial Action Monitoring Programs." National Environmental Monitoring Conference. Washington, DC. August 10, 2010.

Blye, D.R., M.A. Michell, R.A. Royer, and J.A. Zimbron. "Interlaboratory Study on PCB Analysis of Natural Waters by Method 1668A." Battelle Fifth International Conference on Remediation of Contaminated Sediments. Jacksonville, FL. February 3, 2009.

Roberts, T.M. III, R.J. Vitale, and M.A. Michell. "Assessment of the Effects of Active Sites in Discrete Sampling, Purge and Trap Concentrators on Oxygenated Compounds." WTQA 2001. Washington, DC. August 14, 2001.

Michell, M. A. and R. J. Vitale. "How to Assess Data Quality for Better Decisions." *Clearwater*, New York Water Environmental Association (NYWEA), Vol. 26, No. 2 (Summer 1996).

Michell, M. A. and M. J. Piccone. "Regional Variations in the Evaluations of Analytical Data." SUPERFUND XV. Washington, DC. November 29 - December 1, 1994.

FIELDS OF COMPETENCE

- Analytical and environmental forensic evaluation
- Analytical method specification design and third-party evaluation
- Laboratory program design, execution, and maintenance
- Laboratory auditing
- Continuous emission monitoring system audit/evaluation
- Performance evaluation (PE) study design and execution
- Project-specific analytical/sampling Request for Proposal (RFP) preparation
- Project-specific quality assurance (QA) oversight
- Quality Assurance Project Plan (QAPP) and data quality objective (DQO) preparation and evaluation
- Rigorous third-party data validation for remedial investigation/feasibility study (RI/FS), Resource Conservation and Recovery Act (RCRA) facility investigation/corrective measures study (RFI/CMS), Permit B, delisting studies, and Clean Air Act (CAA) stack tests
- Technical liaison among laboratories, industries, and consultants
- Theoretical and practical knowledge of all facets of quantitative analysis for organic, inorganic, and general chemistry pollutants by published methodologies
- Air, surface, and bulk sampling using viable and nonviable collection procedures for fungal and other biological analytes
- Air, surface, and bulk sampling using active and passive sample collection procedures for chemical analytes

- Indoor air quality (IAQ) investigation/design and execution for chemical and biological contamination and assessment of indoor environments

CREDENTIALS

B.S., Chemistry, Shippensburg University, Pennsylvania, 1988.

Shippensburg University, Pennsylvania. Graduate Analytical Chemistry Course Work.

CERTIFICATIONS

Certified Environmental Analytical Chemist (CEAC) – National Registry of Certified Chemists (NRCC), Washington, DC.

PROFESSIONAL DEVELOPMENT COURSES

“Agilent OpenLAB CDS ChemStation User Training.” Valley Forge, PA. September 24 and 25, 2015.

“IAQA Philadelphia Chapter Workshop.” Indoor Air Quality Association Philadelphia Chapter. Villanova, PA. December 11, 2009.

“Mold, Allergens, Sampling, and Data Interpretation.” Environmental Microbiology Laboratory. Philadelphia, PA. December 12, 2006.

“IAQ/IH Sampling Workshop.” EMSL Analytical, Inc. Plymouth Meeting, PA. May 15, 2008.

PROFESSIONAL AFFILIATIONS

American Institute of Chemists – Member
American Industrial Hygiene Association, Philadelphia Section – Member
American Society for Quality – Member



SUMMARY OF EXPERIENCE

Mr. Zeiner has 29 years of analytical and QA experience. Specifically, he has 2 years of analytical experience performing analyses for organic contaminants in a variety of media by instrumental methods, including research and development of analytical methodologies.

As a Senior Technical Chemist, Mr. Zeiner has 27 years of experience in the following fields: project management; project scoping and costing; design and execution of contract laboratory programs; method development and validation; forensic evaluation of data; forensic project design; laboratory audits/evaluations; third-party review and production of QAPPs; RCRA facility investigation/corrective action plan (RFI/CAP) and remedial actions; design of specialty analytical data package deliverables to accommodate project-specific DQOs; organic, inorganic, and general chemistry data validation; third-party review and critique of laboratory-prepared analytical methods; specification of quality assurance/quality control (QA/QC) parameters for investigative sampling events; third-party review and critique of laboratory standard operating procedures (SOPs); sample collection program design; design and execution of performance evaluation studies; IAQ investigation design/execution and litigation support; and air sample collection using a variety of methods.

Prior to employment at Environmental Standards, Mr. Zeiner was a Chemist for a large independent analytical laboratory. He was responsible for performing volatile organic analyses by SW-846 and US EPA 500 and 600 Series Methods using purge-and-trap gas chromatography (GC) with photoionization (PID), flame ionization (FID), and electrolyte conductivity detectors (ELCD). His responsibilities included writing laboratory-specific modifications of SW-846 and US EPA methods, writing and updating SOPs, designing and implementing a comprehensive repair and preventive maintenance program, and training 16 Chemists in the repair and performance of preventive maintenance procedures for purge-and-trap GCs. In addition, he researched and developed a laboratory method for the application of purge-and-trap GC techniques for

separation and detection of non-halogenated/non-aromatic volatile organic compounds.

KEY PROJECTS

- Served as part of the Emergency Response Team for an oil spill in the Gulf of Mexico. Served as Data Validation Task Manager and provided technical support for the QA oversight efforts. The project included thousands of samples collected and analyzed for a wide variety of analytes. The project team coordinated with multiple laboratories, consultants, and governmental agencies to facilitate the collection, submission, analysis, and reporting of the analytical data. The data collected were utilized for forensic analysis of the data and for risk assessments. The data validation effort included both Stage 2A and Stage 4 validation efforts.
- Served as part of the Project Team that critically reviewed and commented on SW-846 Method 8327 for preparation and analysis of per- and polyfluoroalkyl substances (PFAS) analytes.
- Served as client contact and Project Manager for a large Region II Site. Environmental Standards' assignment was to provide data validation, data management support, and chemistry support. The analytical suite included Contract Laboratory Program (CLP) organic and inorganic parameters.
- Served as Project Manager for a New York State landfill investigation that included aqueous, sediment, soil, and fish tissue samples analyzed for PFAS analytes. The PFAS analyses included isomer-specific analysis for PFOS and PFOA, and total oxidizable precursor (TOP) assay analysis.
- Served as Project Manager and QA support for a large Region II CLP Superfund investigation. The Client requested that Environmental Standards provide support as the prior data validation firm had neither adequately evaluated data, nor supported the project electronic data needs. The Client was able to complete the sample collection,



KEY PROJECTS (Continued)

- analysis, and reporting to meet the initial investigation project timeline and meet project goals.
- Served as Technical Lead on the development of PFAS sample collection, sample analysis, and results reporting documents. The project supports the Client's need to control the quality of the PFAS data being generated as part of its sites in a number of states. The Client has utilized these guidance documents to improve consistency, analytical, and reporting accuracy for its sites.
 - Served as Technical Lead on a hexavalent chromium emission performance study. The objective of the study was to address the concern that the methodology had the potential for inter-valence conversion of trivalent chromium to hexavalent chromium and/or of hexavalent chromium to trivalent chromium during sample collection, preparation, and analysis due to the sample matrix. US EPA Method 0061 indicates that sample matrix may facilitate the conversion and that a post-sampling nitrogen purge and sample filtration are ways to address these potential matrix issues.
 - Conducted on-site audits of numerous environmental analytical laboratory facilities. The on-site audits included evaluations of the laboratory's sample login and receipt procedures, organization, sample preparation methods, analytical expertise and method compliance, QA/QC procedures, logbook documentation procedures, data package preparation procedures, and results reporting and review procedures. Co-authored detailed audit reports that included descriptions of the laboratory procedures and recommendations for improvements.
 - Performed in-depth, on-site audits of the QA/QC systems at four chemical agent disposal facilities in Alabama, Arkansas, Oregon, and Utah. These audits required an understanding of the acceptable exposure limits and the analytical challenge program required by the U.S. Army Chemical Management Agency for Near Real Time Automatic Continuous Air Monitoring Systems (ACAMS) and Depot Area Air Monitoring Systems (DAAMS) historical and confirmatory analyses. These audits required an understanding of appropriate conditions of operations, the Laboratory Analysis Monitoring Plan, the Laboratory QC Plan, and the SOPs for the sample collection and analysis.
 - Served as Data Validation Task Manager for a large Natural Resources Damage Assessment project in the Gulf of Mexico. The Project Team coordinated with multiple laboratories and consultants for validation and reporting of the analytical data. The data validation effort included both Stage 2B and Stage 4 validation efforts.
 - Served as Analytical Data Quality Manager and client contact for a Fortune 500 industrial client as part of a corporate laboratory program integrated with data management. Duties included on-site training, assistance to address project analytical problems, analytical laboratory recommendations, audit coordination, performance evaluation sample study coordination, invoice review, and development and maintenance of program documents.
 - Served as part of the Environmental Chemistry Team to support defense litigation for a site where the main analyte of concern was technical chlordane. Responsibilities included evaluation of historical data, validation of current data, and production of expert reports. The evaluation of technical chlordane included research into the production and production specifications of technical chlordane.
 - Served as a Project Manager and provided QA support to a Fortune 500 industrial client for a US EPA Region IV site investigation. Served as contact point for analytical performance and data quality issues, managed chemists performing data usability assessment on aqueous samples, and facilitated database modification.



KEY PROJECTS (Continued)

- Served as Data Validation Project Manager for US EPA Region II and New York State Department of Environmental Conservation (NYSDEC) site investigations. Duties included data login and tracking, assisting in technical data validation problems, reviewing QA reports, tracking budgets for data package review, and providing technical assistance to clients.
- Served as Project Manager for the development of a corporate contract laboratory program that included a Laboratory Users/Corporate Quality Assurance Guide. Developed a written survey to collect project information from approximately 80 client sites. Designed a client-specific RFP. Additionally, laboratory audits were performed on the short-listed laboratories, and the laboratory proposals were evaluated and ranked.
 - Served as a Project Manager and provided QA support to a Fortune 500 industrial client for a Texas RFI. Served as contact point for analytical performance and data quality issues, managed Chemists performing data usability assessment on solid and aqueous samples and facilitated database modification.
 - Served as a Project Manager and provided technical support for a major Alaskan oil pipeline company for all remediation and monitoring activities conducted by the company. Served as a contact point for validation requests and managed Chemists performing data validation on solid, aqueous, and waste sample data.
 - Served as a Project Manager and provided technical support to a Fortune 100 industrial client for a US EPA Region II RI/FS. Served as contact point for technical questions regarding data quality issues and managed Chemists performing data validation on solid and aqueous sample data.
 - Served as Project Manager for a preliminary NYSDEC site investigation for polychlorinated biphenyl (PCB) Aroclor characterization. Responsibilities included the preparation of a Request for Quotation (RFQ), review and evaluation of proposals, preparation of data package deliverables that were required for the project-specific analytical protocol, and performance of a laboratory audit of the selected project laboratory.
 - Served as part of the Peer-review Team for the US EPA Region I volatile organic, semivolatile organic, and pesticide/PCB data validation guidelines.
 - Served as an on-site technical consultant to three laboratories. Duties included the review of data package deliverables prior to issuance and the review of analytical data for accuracy and adherence to volatile organic, semivolatile organic, and inorganic method protocols.
 - Served as Data Validation Project Manager and provided QA support for a Metals Parts Furnace Halogenated Wastes and Carbon Micronization System with Deactivation Furnace System Performance Tests portions of a trial burn. Validated liquid, solid, and air samples analyzed for particulate matter, hydrochloric acid, chloride, hydrofluoric acid, trace metals, total organics, polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans, volatile and semivolatile products of incomplete combustion, and PCB congeners. Assisted the client and project laboratory to establish the requirements for a fully documented data package. Provided interface among Environmental Standards, the client, and the project laboratory for resolution of technical issues.
 - Served as part of a Project Team for the review and comparison of US EPA stack testing methodologies and European stack testing methodologies for polychlorinated dibenzodioxin/polychlorinated dibenzofuran.
 - Provided data validation services for an RFI at a major aircraft corporation. Reviewed PCDD/PCDF, volatile, semivolatile, and pesticide/PCB compounds for several data package delivery groups. Prepared reports and performed secondary review of reports and data tables for several additional packages.



KEY PROJECTS (Continued)

- Developed an RFQ that included the analytical specifications and QA/QC procedures necessary for laboratories to perform work and to accurately bid work under the client's environmental contract laboratory program. The laboratories were also requested to provide additional technical information for review by Environmental Standards.
- Co-authored and managed the development of an Environmental Contract Laboratory Program – Analytical Services and Quality Assurance Guidance Manual, which included information useful both to the client's staff for project planning and to the laboratory's staff for sample analysis and data package generation. Topics in the manual included analytical methods, data package specifications, communication schemes, DQO options, QA/QC procedures, corrective actions, and electronic deliverable specifications.
- Served as part of a team that audited and evaluated several laboratories' sample login and receipt procedures, organization, sample preparation methods, analytical expertise and method compliance, QA/QC procedures, documentation procedures, data packaging procedures, and results reporting methods. Co-authored detailed audit reports that included descriptions of the laboratories' procedures. A ranking report based on the technical aspects evaluated during the audits was provided to the client.
- Served as part of a team that provided data management for a major gas pipeline company spanning nine states in the eastern United States.

PUBLICATIONS

Zeiner, S. T., R. L. Forman, M. M. Burcham, and M. Cohen. "A Comparative Evaluation of Quality Control Results." *The Chemist*, Vol. 77, No. 6 (November/December 2000).

Zeiner, S. T. Book Review of "A Case for Wetland Restoration" by Donald L. Hex, Ph.D., and Nancy S. Philippi. *The Chemist*, Vol. 77, No. 2 (March/April 2000).

Zeiner, S. T. Book Review of "A Practical Guide to Graphite Furnace. Atomic Absorption Spectrometry" by D. Butchar and J. Sheddon. *The Chemist*, Vol. 75, No. 5 (November/December 1998).

Zeiner, S. T. "HazWaste World/SUPERFUND XVII." *The Chemist*, Vol. 73, No. 6 (November/December 1996).

PRESENTATIONS/POSTERS

Zeiner, S.T. "PFAS – Background, Regulations, and Sample Collection/Analytical Hurdles" 2019 Pennsylvania Association of Accredited Environmental Laboratories Annual Meeting. Harrisburg, PA, October 22 and 23, 2019.

Zeiner, S.T., D. R. Blye, and M. A. Michell. "Considerations for Analysis of Perfluoroalkyl and Polyfluoroalkyl Substances in Non-Drinking Water Samples" 34th Annual International Conference on Soils, Sediments, Water, & Energy, Amherst, MA, October 15-18, 2018.

Zeiner, S. T., R. J. Vitale, and G. P. Yakub. "Little Extraction Detail, Big Impact on Performance – A Case Study" National Environmental Monitoring Conference. Washington, DC, August 4-8, 2014.

Zeiner, S.T., D. R. Blye, L. Holman, and K. Rinehimer. "Acrolein, Acrylonitrile, Styrene, and Vinyl Chloride; Acid Reactive Compounds or Not?" National Environmental Monitoring Conference. San Antonio, TX, August 4-8, 2013.

Zeiner, S. T., A. Powley, and J. Pawlish. "Evaluation of Aqueous Field and Equipment Blank Data and the Associated Solid Samples." 28th Annual International Conference on Soils, Sediments, And Water. Amherst, MA, October 15-18, 2012.



PRESENTATIONS/POSTERS (Continued)

Zeiner, S. T. and K. Harsh. "Native or Contamination? All A Matter of Perspective!" National Environmental Monitoring Conference. Washington, DC, August 6-9, 2012.

Zeiner, S. T. "What Do You Do With Field Duplicates? Case Studies on Usability Assessment and Application to Site Investigations." National Environmental Monitoring Conference. Washington, DC, August 10-15, 2008.

Zeiner, S. T. "Apples, Oranges, and SW-846 – National Functional Guidelines Revision Critique." National Environmental Monitoring Conference. Washington, DC, August 10-15, 2008.

Zeiner, S. T., R. J. Vitale, D. P. Callaghan, and J. Kraycik. "Assessment and Interpretation of Field Duplicates – A Case Study of a Complex Sediment Investigation." 22nd Annual International Conference on Soils, Sediments, And Water. Amherst, MA, October 16-19, 2006.

Zeiner, S. T., R. L. Forman, and D. R. Blye. "Application of Electronic Data Verification With Data Validation to Site Characterization Projects to Maximize Efforts." National Environmental Monitoring Conference. Washington, DC, July 25-29, 2005.

Zeiner, S. T., E. T. Lahr, and R. J. Vitale. "Perchlorate: Utilization of Ion Chromatography and Liquid Chromatography on Characterization Project." National Environmental Monitoring Conference. Washington, DC, July 25-29, 2005.

Zeiner, S. T. "Your Indoor Environment." Spring-Ford Chamber of Commerce. Limerick, PA, May 26, 2005.

Zeiner, S. T. "Indoor Air Quality (IAQ)/Mold Seminar." King of Prussia, PA, April 7, 2004 and Allentown, PA, June 22, 2004.

Zeiner, S. T., D. J. Lancaster, D. R. Blye, and J. N. Schott. "Evaluating Calibration Model Reliability." National Environmental Monitoring Conference. Washington, DC, July 19-23, 2004.

Zeiner, S. T. and R. L. Forman. "The Combined Power of Electronic Data Verification and Data Validation for Site Characterization and Remediation." National Environmental Monitoring Conference. Arlington, VA, July 21-24, 2003.

Zeiner, S. T., D. J. Lancaster, and R. J. Vitale. "Negative Effects of the 'Grand Mean' Calibration Approach on Generated Internal Surrogate Compound Recovery Limits." Waste Testing and Quality Assurance Symposium. Arlington, VA, August 12-16, 2001.

Zeiner, S. T., R. L. Forman, M. M. Burcham, and M. Cohen. "Comparison of Laboratory Duplicate, Matrix Spike, and Field Duplicate Results for Lead, Chromium, Nickel, and Barium in a Multi-State Pipeline Investigation." Pittsburgh Conference, Orlando, FL, March 7-12, 1999 and American Institute of Chemists 76th National Meeting, Arlington, VA, June 1-3, 2000.

Zeiner, S. T. "Site Characterization Planning: The Importance of Quality Control Samples." American Institute of Chemists 75th National Meeting. Philadelphia, PA, May 28-30, 1998.

Zeiner, S. T. "Realistic Criteria for the Evaluation of Field Duplicate Sample Results." SUPERFUND XV. Washington, DC, November 29-December 1, 1994.

Attachment B

Accreditations

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019
Revised September 03, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

*is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES POTABLE WATER
All approved analytes are listed below:*

Dissolved Gases

Acetylene	RSK-175
Ethane	RSK-175
Ethene (Ethylene)	RSK-175
Methane	RSK-175

Fuel Additives

Methyl tert-butyl ether	EPA 524.2
Naphthalene	EPA 524.2

Metals I

Arsenic, Total	EPA 200.8 Rev. 5.4
Barium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Cadmium, Total	EPA 200.8 Rev. 5.4
Chromium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Copper, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Iron, Total	EPA 200.7 Rev. 4.4
Lead, Total	EPA 200.8 Rev. 5.4
Manganese, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Mercury, Total	EPA 245.1 Rev. 3.0
Selenium, Total	EPA 200.8 Rev. 5.4
Silver, Total	EPA 200.7 Rev. 4.4
Zinc, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4

Metals II

Aluminum, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Antimony, Total	EPA 200.8 Rev. 5.4
Beryllium, Total	EPA 200.8 Rev. 5.4
Nickel, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Thallium, Total	EPA 200.8 Rev. 5.4
Vanadium, Total	EPA 200.7 Rev. 4.4

Metals III

Calcium, Total	EPA 200.7 Rev. 4.4
Magnesium, Total	EPA 200.7 Rev. 4.4
Potassium, Total	EPA 200.7 Rev. 4.4
Sodium, Total	EPA 200.7 Rev. 4.4

Methylcarbamate Pesticides

3-Hydroxy Carbofuran	EPA 531.1
Aldicarb	EPA 531.1
Aldicarb Sulfone	EPA 531.1
Aldicarb Sulfoxide	EPA 531.1
Carbaryl	EPA 531.1
Carbofuran	EPA 531.1
Methomyl	EPA 531.1
Oxamyl	EPA 531.1

Miscellaneous

2,3,7,8-Tetrachlorodibenzo-p-dioxin	EPA 1613B
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Serial No.: 60499

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019
Revised September 03, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

*is hereby APPROVED as an Environmental Laboratory in conformance with the
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ENVIRONMENTAL ANALYSES POTABLE WATER
All approved analytes are listed below:*

Miscellaneous

Methyl iodide	EPA 524.2
Organic Carbon, Total	SM 21-23 5310C (-00)
Surfactant (MBAS)	SM 21-23 5540C (-00)
Turbidity	SM 21-23 2130 B (-01)
	EPA 180.1 Rev. 2.0

Non-Metals

Alkalinity	SM 21-23 2320B (-97)
Calcium Hardness	SM 18-22 2340C (-97)
	SM 18-22 2340B (-97)
Chloride	EPA 300.0 Rev. 2.1
Color	SM 21-23 2120B (-01)
Cyanide	EPA 335.4 Rev. 1.0
Fluoride, Total	EPA 300.0 Rev. 2.1
	SM 21-23 4500-F C (-97)
Nitrate (as N)	EPA 353.2 Rev. 2.0
	EPA 300.0 Rev. 2.1
Nitrite (as N)	EPA 353.2 Rev. 2.0
	EPA 300.0 Rev. 2.1
Orthophosphate (as P)	SM 19, 21-23 4500-P E (-99)
Silica, Dissolved	SM 21-23 4500-SiO ₂ C (-97)
Solids, Total Dissolved	SM 21-23 2540C (-97)
Specific Conductance	SM 21-23 2510B (-97)
Sulfate (as SO ₄)	EPA 300.0 Rev. 2.1

Perfluorinated Alkyl Acids

Perfluorooctanesulfonic acid (PFOS)	EPA 537
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Perfluorinated Alkyl Acids

Perfluorooctanesulfonic acid (PFOS)	EPA 537.1
Perfluorooctanoic acid (PFOA)	EPA 537
	EPA 537.1

Trihalomethanes

Bromodichloromethane	EPA 524.2
Bromoform	EPA 524.2
Chloroform	EPA 524.2
Dibromochloromethane	EPA 524.2
Total Trihalomethanes	EPA 524.2

Volatile Aromatics

1,2,3-Trichlorobenzene	EPA 524.2
1,2,4-Trichlorobenzene	EPA 524.2
1,2,4-Trimethylbenzene	EPA 524.2
1,2-Dichlorobenzene	EPA 524.2
1,3,5-Trimethylbenzene	EPA 524.2
1,3-Dichlorobenzene	EPA 524.2
1,4-Dichlorobenzene	EPA 524.2
2-Chlorotoluene	EPA 524.2
4-Chlorotoluene	EPA 524.2
Benzene	EPA 524.2
Bromobenzene	EPA 524.2
Chlorobenzene	EPA 524.2
Ethyl benzene	EPA 524.2
Hexachlorobutadiene	EPA 524.2
Isopropylbenzene	EPA 524.2

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Volatile Aromatics

n-Butylbenzene	EPA 524.2
n-Propylbenzene	EPA 524.2
p-Isopropyltoluene (P-Cymene)	EPA 524.2
sec-Butylbenzene	EPA 524.2
Styrene	EPA 524.2
tert-Butylbenzene	EPA 524.2
Toluene	EPA 524.2
Total Xylenes	EPA 524.2

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 524.2
1,1,1-Trichloroethane	EPA 524.2
1,1,2,2-Tetrachloroethane	EPA 524.2
1,1,2-Trichloroethane	EPA 524.2
1,1-Dichloroethane	EPA 524.2
1,1-Dichloroethene	EPA 524.2
1,1-Dichloropropene	EPA 524.2
1,2,3-Trichloropropane	EPA 524.2
1,2-Dichloroethane	EPA 524.2
1,2-Dichloropropane	EPA 524.2
1,3-Dichloropropane	EPA 524.2
2,2-Dichloropropane	EPA 524.2
Bromochloromethane	EPA 524.2
Bromomethane	EPA 524.2
Carbon tetrachloride	EPA 524.2
Chloroethane	EPA 524.2

Volatile Halocarbons

Chloromethane	EPA 524.2
cis-1,2-Dichloroethene	EPA 524.2
cis-1,3-Dichloropropene	EPA 524.2
Dibromomethane	EPA 524.2
Dichlorodifluoromethane	EPA 524.2
Methylene chloride	EPA 524.2
Tetrachloroethene	EPA 524.2
trans-1,2-Dichloroethene	EPA 524.2
trans-1,3-Dichloropropene	EPA 524.2
Trichloroethene	EPA 524.2
Trichlorofluoromethane	EPA 524.2
Vinyl chloride	EPA 524.2

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Acrylates

Acrolein (Propenal)	EPA 8260C EPA 624.1
Acrylonitrile	EPA 8260C EPA 624.1
Ethyl methacrylate	EPA 8260C
Methyl acrylonitrile	EPA 8260C
Methyl methacrylate	EPA 8260C

Amines

1,2-Diphenylhydrazine	EPA 625.1 EPA 8270D
1,4-Phenylenediamine	EPA 8270D
1-Naphthylamine	EPA 8270D
2,3-Dichloroaniline	EPA 625.1
2-Naphthylamine	EPA 8270D
2-Nitroaniline	EPA 8270D
3-Nitroaniline	EPA 8270D
4,4'-Methylenebis(2-chloroaniline)	EPA 8270D
4-Chloroaniline	EPA 8270D
4-Nitroaniline	EPA 8270D
5-Nitro-o-toluidine	EPA 8270D
a,a-Dimethylphenethylamine	EPA 8270D
Aniline	EPA 625.1 EPA 8270D
Carbazole	EPA 625.1 EPA 8270D

Amines

Diphenylamine	EPA 8270D
Methapyrilene	EPA 8270D
Pronamide	EPA 8270D
Propionitrile	EPA 8260C
Pyridine	EPA 625.1 EPA 8270D

Benzidines

3,3'-Dichlorobenzidine	EPA 625.1 EPA 8270D
3,3'-Dimethylbenzidine	EPA 8270D
Benzidine	EPA 625.1 EPA 8270D

Chlorinated Hydrocarbon Pesticides

4,4'-DDD	EPA 8081B EPA 608.3
4,4'-DDE	EPA 8081B EPA 608.3
4,4'-DDT	EPA 8081B EPA 608.3
Aldrin	EPA 8081B EPA 608.3
alpha-BHC	EPA 8081B EPA 608.3
alpha-Chlordane	EPA 8081B
beta-BHC	EPA 8081B

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Chlorinated Hydrocarbon Pesticides

beta-BHC	EPA 608.3
Chlordane Total	EPA 8081B
	EPA 608.3
Chlorobenzilate	EPA 8270D
delta-BHC	EPA 8081B
	EPA 608.3
Diallate	EPA 8270D
Dieldrin	EPA 8081B
	EPA 608.3
Endosulfan I	EPA 8081B
	EPA 608.3
Endosulfan II	EPA 8081B
	EPA 608.3
Endosulfan sulfate	EPA 8081B
	EPA 608.3
Endrin	EPA 8081B
	EPA 608.3
Endrin aldehyde	EPA 8081B
	EPA 608.3
Endrin Ketone	EPA 8081B
gamma-Chlordane	EPA 8081B
Heptachlor	EPA 8081B
	EPA 608.3
Heptachlor epoxide	EPA 8081B
	EPA 608.3
Isodrin	EPA 8270D

Chlorinated Hydrocarbon Pesticides

Kepone	EPA 8081B
	EPA 8270D
Lindane	EPA 8081B
	EPA 608.3
Methoxychlor	EPA 8081B
	EPA 608.3
Mirex	EPA 8081B
	EPA 608.3
PCNB	EPA 8270D
Toxaphene	EPA 8081B
	EPA 608.3

Chlorinated Hydrocarbons

1,2,3-Trichlorobenzene	EPA 8260C
1,2,4,5-Tetrachlorobenzene	EPA 8270D
1,2,4-Trichlorobenzene	EPA 625.1
	EPA 8270D
1-Chloronaphthalene	EPA 8270D
2-Chloronaphthalene	EPA 625.1
	EPA 8270D
Hexachlorobenzene	EPA 625.1
	EPA 8270D
Hexachlorobutadiene	EPA 625.1
	EPA 8270D
Hexachlorocyclopentadiene	EPA 625.1
	EPA 8270D

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Chlorinated Hydrocarbons

Hexachloroethane	EPA 8260C
	EPA 625.1
	EPA 8270D
Hexachloropropene	EPA 8270D
Pentachlorobenzene	EPA 8270D

Chlorophenoxy Acid Pesticides

2,4,5-T	EPA 8151A
2,4,5-TP (Silvex)	EPA 8151A
2,4-D	EPA 8151A
2,4-DB	EPA 8151A
Dalapon	EPA 8151A
Dicamba	EPA 8151A
Dichloroprop	EPA 8151A
Dinoseb	EPA 8151A
	EPA 8270D
Pentachlorophenol	EPA 8151A

Demand

Biochemical Oxygen Demand	SM 5210B-2011
Carbonaceous BOD	SM 5210B-2011
Chemical Oxygen Demand	EPA 410.4, Rev. 2.0 (1993)

Dioxins and Furans

1,2,3,4,6,7,8,9-Octachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-diox	EPA 8290A

Dioxins and Furans

1,2,3,4,6,7,8,9-Octachlorodibenzo-p-diox	EPA 1613B
1,2,3,4,6,7,8-Heptachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,4,6,7,8-Heptachlorodibenzo-p-diox	EPA 8290A
	EPA 1613B
1,2,3,4,7,8,9-Heptachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,4,7,8-Hexachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	EPA 8290A
	EPA 1613B
1,2,3,6,7,8-Hexachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	EPA 8290A
	EPA 1613B
1,2,3,7,8,9-Hexachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	EPA 8290A
	EPA 1613B
1,2,3,7,8-Pentachlorodibenzofuran	EPA 8290A
	EPA 1613B
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	EPA 8290A
	EPA 1613B
2,3,4,6,7,8-Hexachlorodibenzofuran	EPA 8290A
	EPA 1613B
2,3,4,7,8-Pentachlorodibenzofuran	EPA 8290A

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Dioxins and Furans

2,3,4,7,8-Pentachlorodibenzofuran	EPA 1613B
2,3,7,8-Tetrachlorodibenzofuran	EPA 8290A
	EPA 1613B
2,3,7,8-Tetrachlorodibenzo-p-dioxin	EPA 8290A
	EPA 1613B

Dissolved Gases

Acetylene	RSK-175
Ethane	RSK-175
Ethene (Ethylene)	RSK-175
Methane	RSK-175
Propane	RSK-175

Fuel Oxygenates

Di-isopropyl ether	EPA 8260C
Ethanol	EPA 1671
	EPA 8260C
	EPA 8015D
	EPA 8015C
Methyl tert-butyl ether	EPA 8260C
	EPA 8021B
	EPA 624.1
tert-amyl alcohol	EPA 8260C
tert-amyl methyl ether (TAME)	EPA 8260C
tert-butyl alcohol	EPA 8260C
	EPA 624.1
tert-butyl ethyl ether (ETBE)	EPA 8260C

Haloethers

2,2'-Oxybis(1-chloropropane)	EPA 625.1
	EPA 8270D
4-Bromophenylphenyl ether	EPA 625.1
	EPA 8270D
4-Chlorophenylphenyl ether	EPA 625.1
	EPA 8270D
Bis(2-chloroethoxy)methane	EPA 625.1
	EPA 8270D
Bis(2-chloroethyl)ether	EPA 625.1
	EPA 8270D

Low Level Halocarbons

1,2-Dibromo-3-chloropropane, Low Level	EPA 8011
1,2-Dibromoethane, Low Level	EPA 8011

Low Level Polynuclear Aromatics

Acenaphthene Low Level	EPA 8270D SIM
Acenaphthylene Low Level	EPA 8270D SIM
Anthracene Low Level	EPA 8270D SIM
Benzo(a)anthracene Low Level	EPA 8270D SIM
Benzo(a)pyrene Low Level	EPA 8270D SIM
Benzo(b)fluoranthene Low Level	EPA 8270D SIM
Benzo(g,h,i)perylene Low Level	EPA 8270D SIM
Benzo(k)fluoranthene Low Level	EPA 8270D SIM
Chrysene Low Level	EPA 8270D SIM
Dibenzo(a,h)anthracene Low Level	EPA 8270D SIM
Fluoranthene Low Level	EPA 8270D SIM

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Low Level Polynuclear Aromatics

Fluorene Low Level	EPA 8270D SIM
Indeno(1,2,3-cd)pyrene Low Level	EPA 8270D SIM
Naphthalene Low Level	EPA 8270D SIM
Phenanthrene Low Level	EPA 8270D SIM
Pyrene Low Level	EPA 8270D SIM

Metals I

Barium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Cadmium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Calcium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Chromium, Total	EPA 200.7, Rev. 4.4 (1994)

Metals I

Chromium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Copper, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Iron, Total	SM 3500-Fe B-2011
	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Lead, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Magnesium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C

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Metals I

Magnesium, Total

EPA 6010D
EPA 6020A
EPA 6020B
EPA 200.8, Rev. 5.4 (1994)

Manganese, Total

EPA 200.7, Rev. 4.4 (1994)
EPA 6010C
EPA 6010D
EPA 6020A

Nickel, Total

EPA 6020B
EPA 200.8, Rev. 5.4 (1994)
EPA 200.7, Rev. 4.4 (1994)
EPA 6010C
EPA 6010D
EPA 6020A
EPA 6020B

Potassium, Total

EPA 200.8, Rev. 5.4 (1994)
EPA 200.7, Rev. 4.4 (1994)
EPA 6010C
EPA 6010D
EPA 6020A
EPA 6020B

Silver, Total

EPA 200.8, Rev. 5.4 (1994)
EPA 200.7, Rev. 4.4 (1994)
EPA 6010C
EPA 6010D
EPA 6020A

Metals I

Silver, Total

EPA 6020B
EPA 200.8, Rev. 5.4 (1994)
EPA 200.7, Rev. 4.4 (1994)

Sodium, Total

EPA 6010C
EPA 6010D
EPA 6020A
EPA 6020B
EPA 200.8, Rev. 5.4 (1994)
EPA 200.7, Rev. 4.4 (1994)

Strontium, Total

EPA 6010C
EPA 6010D
EPA 6020A
EPA 6020B
EPA 200.8, Rev. 5.4 (1994)

Metals II

Aluminum, Total

EPA 200.7, Rev. 4.4 (1994)
EPA 6010C
EPA 6010D
EPA 6020A
EPA 6020B

Antimony, Total

EPA 200.8, Rev. 5.4 (1994)
EPA 200.7, Rev. 4.4 (1994)
EPA 6010C
EPA 6010D
EPA 6020A

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All approved analytes are listed below:*

Metals II

Antimony, Total	EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Arsenic, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Beryllium, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Chromium VI	EPA 218.6, Rev. 3.3 (1994) EPA 7196A EPA 7199 SM 3500-Cr B-2011
Mercury, Total	EPA 245.1, Rev. 3.0 (1994) EPA 7470A
Selenium, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)

Metals II

Vanadium, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Zinc, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)

Metals III

Cobalt, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Molybdenum, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)

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WADSWORTH CENTER



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CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

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All approved analytes are listed below:*

Metals III

Thallium, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Tin, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Titanium, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)
Uranium (Mass)	EPA 6020A EPA 6020B EPA 200.8, Rev. 5.4 (1994)

Mineral

Acidity	SM 2310B-2011
Alkalinity	SM 2320B-2011
Chloride	EPA 300.0, Rev. 2.1 (1993) SM 4500-Cl- C-2011 EPA 9056A
Fluoride, Total	EPA 300.0, Rev. 2.1 (1993)

Mineral

Fluoride, Total	SM 4500-F C-2011 EPA 9056A
Hardness, Total	SM 2340C-2011 SM 2340B-2011
Sulfate (as SO ₄)	EPA 300.0, Rev. 2.1 (1993) EPA 9056A

Miscellaneous

Boron, Total	EPA 200.7, Rev. 4.4 (1994) EPA 6010C EPA 6010D
Bromide	EPA 300.0, Rev. 2.1 (1993) EPA 9056A
Color	SM 2120B-2011
Cyanide, Available	OIA-1677-09 SM 4500-CN G-2011
Cyanide, Free	OIA-1677-09
Cyanide, Total	EPA 335.4, Rev. 1.0 (1993) EPA 9012B ASTM D7511-12
Formaldehyde	EPA 8315A
non-Polar Extractable Material (TPH)	EPA 1664A
Oil and Grease Total Recoverable (HEM)	EPA 1664A EPA 1664B
Organic Carbon, Total	SM 5310C-2011 EPA 9060A

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Miscellaneous

Perchlorate	EPA 6850
Phenols	EPA 420.4, Rev. 1.0 (1993) EPA 9066
Silica, Dissolved	SM 4500-SiO ₂ C-2011
Specific Conductance	SM 2510B-2011 EPA 9050A
Sulfide (as S)	SM 4500-S ₂ -F-2011 SM 4500-S ₂ -D-2011
Surfactant (MBAS)	SM 5540C-2011
Turbidity	EPA 180.1, Rev. 2.0 (1993)

Nitroaromatics and Isophorone

1,3,5-Trinitrobenzene	EPA 8270D EPA 8330A
1,3-Dinitrobenzene	EPA 8270D EPA 8330A
1,4-Naphthoquinone	EPA 8270D
2,4,6-Trinitrotoluene	EPA 8330A
2,4-Dinitrotoluene	EPA 625.1 EPA 8270D EPA 8330A
2,6-Dinitrotoluene	EPA 625.1 EPA 8270D EPA 8330A
2-Amino-4,6-dinitrotoluene	EPA 8330A EPA 8330B

Nitroaromatics and Isophorone

2-Nitrotoluene	EPA 8330A
3,5-Dinitroaniline	EPA 8330B
3-Nitrotoluene	EPA 8330A
4-Amino-2,6-dinitrotoluene	EPA 8330A
4-Nitroquinoline-1-oxide	EPA 8270D
4-Nitrotoluene	EPA 8330A
Hexahydro-1,3,5-trinitro-1,3,5-triazine	EPA 8330A
Isophorone	EPA 625.1 EPA 8270D
Methyl-2,4,6-trinitrophenylnitramine	EPA 8330A
Nitrobenzene	EPA 625.1 EPA 8270D EPA 8330A
Nitroglycerine	EPA 8330B
Octahydro-tetranitro-tetrazocine	EPA 8330A
Pentaerythritol tetranitrate	EPA 8330B

Nitrosoamines

N-Nitrosodiethylamine	EPA 8270D
N-Nitrosodimethylamine	EPA 625.1 EPA 8270D
N-Nitrosodi-n-butylamine	EPA 8270D
N-Nitrosodi-n-propylamine	EPA 625.1 EPA 8270D
N-Nitrosodiphenylamine	EPA 625.1 EPA 8270D

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Nitrosoamines

N-nitrosomethylethylamine	EPA 8270D
N-nitrosomorpholine	EPA 8270D
N-nitrosopiperidine	EPA 8270D
N-Nitrosopyrrolidine	EPA 8270D

Nutrient

Ammonia (as N)	SM 4500-NH3 C-2011 EPA 350.1, Rev. 2.0 (1993) SM 4500-NH3 D-2011 or E-2011
Kjeldahl Nitrogen, Total	EPA 351.2, Rev. 2.0 (1993)
Nitrate (as N)	EPA 353.2, Rev. 2.0 (1993) EPA 300.0, Rev. 2.1 (1993) EPA 9056A
Nitrate-Nitrite (as N)	EPA 353.2, Rev. 2.0 (1993)
Nitrite (as N)	EPA 353.2, Rev. 2.0 (1993) EPA 300.0, Rev. 2.1 (1993) EPA 9056A
Orthophosphate (as P)	EPA 365.3 (Issued 1978) SM 4500-P E-2011
Phosphorus, Total	EPA 365.1, Rev. 2.0 (1993) SM 4500-P (F-H)-2011

Organophosphate Pesticides

Atrazine	EPA 8141B EPA 8270D
Azinphos methyl	EPA 8141B
Chlorpyrifos	EPA 8141B

Organophosphate Pesticides

Demeton-O	EPA 8141B
Demeton-S	EPA 8141B
Diazinon	EPA 8141B
Dimethoate	EPA 8270D
Disulfoton	EPA 8141B EPA 8270D
Famphur	EPA 8141B EPA 8270D
Malathion	EPA 8141B
Parathion ethyl	EPA 8141B EPA 8270D
Parathion methyl	EPA 8141B EPA 8270D
Phorate	EPA 8141B EPA 8270D
Simazine	EPA 8141B
Sulfotepp	EPA 8270D
Thionazin	EPA 8270D

Petroleum Hydrocarbons

Diesel Range Organics	EPA 8015D EPA 8015C
Gasoline Range Organics	EPA 8015D EPA 8015C

Phthalate Esters

Benzyl butyl phthalate	EPA 625.1
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Phthalate Esters

Benzyl butyl phthalate	EPA 8270D
Bis(2-ethylhexyl) phthalate	EPA 625.1
	EPA 8270D
Diethyl phthalate	EPA 625.1
	EPA 8270D
Dimethyl phthalate	EPA 625.1
	EPA 8270D
Di-n-butyl phthalate	EPA 625.1
	EPA 8270D
Di-n-octyl phthalate	EPA 625.1
	EPA 8270D

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
	EPA 608.3
Aroclor 1221 (PCB-1221)	EPA 8082A
	EPA 608.3
Aroclor 1232 (PCB-1232)	EPA 8082A
	EPA 608.3
Aroclor 1242 (PCB-1242)	EPA 8082A
	EPA 608.3
Aroclor 1248 (PCB-1248)	EPA 8082A
	EPA 608.3
Aroclor 1254 (PCB-1254)	EPA 8082A
	EPA 608.3
Aroclor 1260 (PCB-1260)	EPA 8082A

Polychlorinated Biphenyls

Aroclor 1260 (PCB-1260)	EPA 608.3
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
PCB 1	EPA 1668A
	EPA 1668C
PCB 10	EPA 1668A
	EPA 1668C
PCB 100	EPA 1668A
	EPA 1668C
PCB 101	EPA 1668A
	EPA 1668C
PCB 102	EPA 1668A
	EPA 1668C
PCB 103	EPA 1668A
	EPA 1668C
PCB 104	EPA 1668A
	EPA 1668C
PCB 105	EPA 1668A
	EPA 1668C
PCB 106	EPA 1668A
	EPA 1668C
PCB 107	EPA 1668A
	EPA 1668C
PCB 108	EPA 1668A
	EPA 1668C
PCB 109	EPA 1668A

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

PCB 109	EPA 1668C
PCB 11	EPA 1668A
	EPA 1668C
PCB 110	EPA 1668A
	EPA 1668C
PCB 111	EPA 1668A
	EPA 1668C
PCB 112	EPA 1668A
	EPA 1668C
PCB 113	EPA 1668A
	EPA 1668C
PCB 114	EPA 1668A
	EPA 1668C
PCB 115	EPA 1668A
	EPA 1668C
PCB 116	EPA 1668A
	EPA 1668C
PCB 117	EPA 1668A
	EPA 1668C
PCB 118	EPA 1668A
	EPA 1668C
PCB 119	EPA 1668A
	EPA 1668C
PCB 12	EPA 1668A
	EPA 1668C
PCB 120	EPA 1668A

PCB 120	EPA 1668C
PCB 121	EPA 1668A
	EPA 1668C
PCB 122	EPA 1668A
	EPA 1668C
PCB 123	EPA 1668A
	EPA 1668C
PCB 124	EPA 1668A
	EPA 1668C
PCB 125	EPA 1668A
	EPA 1668C
PCB 126	EPA 1668A
	EPA 1668C
PCB 127	EPA 1668A
	EPA 1668C
PCB 128	EPA 1668A
	EPA 1668C
PCB 129	EPA 1668A
	EPA 1668C
PCB 13	EPA 1668A
	EPA 1668C
PCB 130	EPA 1668A
	EPA 1668C
PCB 131	EPA 1668A
	EPA 1668C
PCB 132	EPA 1668A

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Polychlorinated Biphenyls

PCB 132	EPA 1668C
PCB 133	EPA 1668A
	EPA 1668C
PCB 134	EPA 1668A
	EPA 1668C
PCB 135	EPA 1668A
	EPA 1668C
PCB 136	EPA 1668A
	EPA 1668C
PCB 137	EPA 1668A
	EPA 1668C
PCB 138	EPA 1668A
	EPA 1668C
PCB 139	EPA 1668A
	EPA 1668C
PCB 14	EPA 1668A
	EPA 1668C
PCB 140	EPA 1668A
	EPA 1668C
PCB 141	EPA 1668A
	EPA 1668C
PCB 142	EPA 1668A
	EPA 1668C
PCB 143	EPA 1668A
	EPA 1668C
PCB 144	EPA 1668A

Polychlorinated Biphenyls

PCB 144	EPA 1668C
PCB 145	EPA 1668A
	EPA 1668C
PCB 146	EPA 1668A
	EPA 1668C
PCB 147	EPA 1668A
	EPA 1668C
PCB 148	EPA 1668A
	EPA 1668C
PCB 149	EPA 1668A
	EPA 1668C
PCB 15	EPA 1668A
	EPA 1668C
PCB 150	EPA 1668A
	EPA 1668C
PCB 151	EPA 1668A
	EPA 1668C
PCB 152	EPA 1668A
	EPA 1668C
PCB 153	EPA 1668A
	EPA 1668C
PCB 154	EPA 1668A
	EPA 1668C
PCB 155	EPA 1668A
	EPA 1668C
PCB 156	EPA 1668A

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Polychlorinated Biphenyls

PCB 156	EPA 1668C
PCB 157	EPA 1668A
	EPA 1668C
PCB 158	EPA 1668A
	EPA 1668C
PCB 159	EPA 1668A
	EPA 1668C
PCB 16	EPA 1668A
	EPA 1668C
PCB 160	EPA 1668A
	EPA 1668C
PCB 161	EPA 1668A
	EPA 1668C
PCB 162	EPA 1668A
	EPA 1668C
PCB 163	EPA 1668A
	EPA 1668C
PCB 164	EPA 1668A
	EPA 1668C
PCB 165	EPA 1668A
	EPA 1668C
PCB 166	EPA 1668A
	EPA 1668C
PCB 167	EPA 1668A
	EPA 1668C
PCB 168	EPA 1668A

Polychlorinated Biphenyls

PCB 168	EPA 1668C
PCB 169	EPA 1668A
	EPA 1668C
PCB 17	EPA 1668A
	EPA 1668C
PCB 170	EPA 1668A
	EPA 1668C
PCB 171	EPA 1668A
	EPA 1668C
PCB 172	EPA 1668A
	EPA 1668C
PCB 173	EPA 1668A
	EPA 1668C
PCB 174	EPA 1668A
	EPA 1668C
PCB 175	EPA 1668A
	EPA 1668C
PCB 176	EPA 1668A
	EPA 1668C
PCB 177	EPA 1668A
	EPA 1668C
PCB 178	EPA 1668A
	EPA 1668C
PCB 179	EPA 1668A
	EPA 1668C
PCB 18	EPA 1668A

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Polychlorinated Biphenyls

PCB 18	EPA 1668C
PCB 180	EPA 1668A
	EPA 1668C
PCB 181	EPA 1668A
	EPA 1668C
PCB 182	EPA 1668A
	EPA 1668C
PCB 183	EPA 1668A
	EPA 1668C
PCB 184	EPA 1668A
	EPA 1668C
PCB 185	EPA 1668A
	EPA 1668C
PCB 186	EPA 1668A
	EPA 1668C
PCB 187	EPA 1668A
	EPA 1668C
PCB 188	EPA 1668A
	EPA 1668C
PCB 189	EPA 1668A
	EPA 1668C
PCB 19	EPA 1668A
	EPA 1668C
PCB 190	EPA 1668A
	EPA 1668C
PCB 191	EPA 1668A

Polychlorinated Biphenyls

PCB 191	EPA 1668C
PCB 192	EPA 1668A
	EPA 1668C
PCB 193	EPA 1668A
	EPA 1668C
PCB 194	EPA 1668A
	EPA 1668C
PCB 195	EPA 1668A
	EPA 1668C
PCB 196	EPA 1668A
	EPA 1668C
PCB 197	EPA 1668A
	EPA 1668C
PCB 198	EPA 1668A
	EPA 1668C
PCB 199	EPA 1668A
	EPA 1668C
PCB 2	EPA 1668A
	EPA 1668C
PCB 20	EPA 1668A
	EPA 1668C
PCB 200	EPA 1668A
	EPA 1668C
PCB 201	EPA 1668A
	EPA 1668C
PCB 202	EPA 1668A

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PCB 202	EPA 1668C
PCB 203	EPA 1668A
	EPA 1668C
PCB 204	EPA 1668A
	EPA 1668C
PCB 205	EPA 1668A
	EPA 1668C
PCB 206	EPA 1668A
	EPA 1668C
PCB 207	EPA 1668A
	EPA 1668C
PCB 208	EPA 1668A
	EPA 1668C
PCB 209	EPA 1668A
	EPA 1668C
PCB 21	EPA 1668A
	EPA 1668C
PCB 22	EPA 1668A
	EPA 1668C
PCB 23	EPA 1668A
	EPA 1668C
PCB 24	EPA 1668A
	EPA 1668C
PCB 25	EPA 1668A
	EPA 1668C
PCB 26	EPA 1668A

Polychlorinated Biphenyls

PCB 26	EPA 1668C
PCB 27	EPA 1668A
	EPA 1668C
PCB 28	EPA 1668A
	EPA 1668C
PCB 29	EPA 1668A
	EPA 1668C
PCB 3	EPA 1668A
	EPA 1668C
PCB 30	EPA 1668A
	EPA 1668C
PCB 31	EPA 1668A
	EPA 1668C
PCB 32	EPA 1668A
	EPA 1668C
PCB 33	EPA 1668A
	EPA 1668C
PCB 34	EPA 1668A
	EPA 1668C
PCB 35	EPA 1668A
	EPA 1668C
PCB 36	EPA 1668A
	EPA 1668C
PCB 37	EPA 1668A
	EPA 1668C
PCB 38	EPA 1668A

Serial No.: 60380

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019
Revised June 21, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:

Polychlorinated Biphenyls

PCB 38	EPA 1668C
PCB 39	EPA 1668A
	EPA 1668C
PCB 4	EPA 1668A
	EPA 1668C
PCB 40	EPA 1668A
	EPA 1668C
PCB 41	EPA 1668A
	EPA 1668C
PCB 42	EPA 1668A
	EPA 1668C
PCB 43	EPA 1668A
	EPA 1668C
PCB 44	EPA 1668A
	EPA 1668C
PCB 45	EPA 1668A
	EPA 1668C
PCB 46	EPA 1668A
	EPA 1668C
PCB 47	EPA 1668A
	EPA 1668C
PCB 48	EPA 1668A
	EPA 1668C
PCB 49	EPA 1668A
	EPA 1668C
PCB 5	EPA 1668A

Polychlorinated Biphenyls

PCB 5	EPA 1668C
PCB 50	EPA 1668A
	EPA 1668C
PCB 51	EPA 1668A
	EPA 1668C
PCB 52	EPA 1668A
	EPA 1668C
PCB 53	EPA 1668A
	EPA 1668C
PCB 54	EPA 1668A
PCB 55	EPA 1668A
	EPA 1668C
PCB 56	EPA 1668A
	EPA 1668C
PCB 57	EPA 1668A
	EPA 1668C
PCB 58	EPA 1668A
	EPA 1668C
PCB 59	EPA 1668A
	EPA 1668C
PCB 6	EPA 1668A
	EPA 1668C
PCB 60	EPA 1668A
	EPA 1668C
PCB 61	EPA 1668A
	EPA 1668C

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Polychlorinated Biphenyls

PCB 62	EPA 1668A
	EPA 1668C
PCB 63	EPA 1668A
	EPA 1668C
PCB 64	EPA 1668A
	EPA 1668C
PCB 65	EPA 1668A
	EPA 1668C
PCB 66	EPA 1668A
	EPA 1668C
PCB 67	EPA 1668A
	EPA 1668C
PCB 68	EPA 1668A
	EPA 1668C
PCB 69	EPA 1668A
	EPA 1668C
PCB 7	EPA 1668A
	EPA 1668C
PCB 70	EPA 1668A
	EPA 1668C
PCB 71	EPA 1668A
	EPA 1668C
PCB 72	EPA 1668A
	EPA 1668C
PCB 73	EPA 1668A
	EPA 1668C

Polychlorinated Biphenyls

PCB 74	EPA 1668A
	EPA 1668C
PCB 75	EPA 1668A
	EPA 1668C
PCB 76	EPA 1668A
	EPA 1668C
PCB 77	EPA 1668A
	EPA 1668C
PCB 78	EPA 1668A
	EPA 1668C
PCB 79	EPA 1668A
	EPA 1668C
PCB 8	EPA 1668A
	EPA 1668C
PCB 80	EPA 1668A
	EPA 1668C
PCB 81	EPA 1668A
	EPA 1668C
PCB 82	EPA 1668A
	EPA 1668C
PCB 83	EPA 1668A
	EPA 1668C
PCB 84	EPA 1668A
	EPA 1668C
PCB 85	EPA 1668A
	EPA 1668C

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Polychlorinated Biphenyls

PCB 86	EPA 1668A
	EPA 1668C
PCB 87	EPA 1668A
	EPA 1668C
PCB 88	EPA 1668A
	EPA 1668C
PCB 89	EPA 1668A
PCB 9	EPA 1668A
	EPA 1668C
PCB 90	EPA 1668A
	EPA 1668C
PCB 91	EPA 1668A
	EPA 1668C
PCB 92	EPA 1668A
	EPA 1668C
PCB 93	EPA 1668A
	EPA 1668C
PCB 94	EPA 1668A
	EPA 1668C
PCB 95	EPA 1668A
	EPA 1668C
PCB 96	EPA 1668A
	EPA 1668C
PCB 97	EPA 1668A
	EPA 1668C
PCB 98	EPA 1668A

Polychlorinated Biphenyls

PCB 98	EPA 1668C
PCB 99	EPA 1668A
	EPA 1668C
PCB Congeners, Total	EPA 1668C

Polynuclear Aromatics

2-Acetylaminofluorene	EPA 8270D
3-Methylcholanthrene	EPA 8270D
7,12-Dimethylbenzyl (a) anthracene	EPA 8270D
Acenaphthene	EPA 625.1
	EPA 8270D
Acenaphthylene	EPA 625.1
	EPA 8270D
Anthracene	EPA 625.1
	EPA 8270D
Benzo(a)anthracene	EPA 625.1
	EPA 8270D
Benzo(a)pyrene	EPA 625.1
	EPA 8270D
Benzo(b)fluoranthene	EPA 625.1
	EPA 8270D
Benzo(g,h,i)perylene	EPA 625.1
	EPA 8270D
Benzo(k)fluoranthene	EPA 625.1
	EPA 8270D
Chrysene	EPA 625.1

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Polynuclear Aromatics

Chrysene	EPA 8270D
Dibenzo(a,h)anthracene	EPA 625.1
	EPA 8270D
Fluoranthene	EPA 625.1
	EPA 8270D
Fluorene	EPA 625.1
	EPA 8270D
Indeno(1,2,3-cd)pyrene	EPA 625.1
	EPA 8270D
Naphthalene	EPA 625.1
	EPA 8270D
Phenanthrene	EPA 625.1
	EPA 8270D
Pyrene	EPA 625.1
	EPA 8270D

Priority Pollutant Phenols

2,3,4,6 Tetrachlorophenol	EPA 8270D
2,4,5-Trichlorophenol	EPA 625.1
	EPA 8270D
2,4,6-Trichlorophenol	EPA 625.1
	EPA 8270D
2,4-Dichlorophenol	EPA 625.1
	EPA 8270D
2,4-Dimethylphenol	EPA 625.1
	EPA 8270D

Priority Pollutant Phenols

2,4-Dinitrophenol	EPA 625.1
	EPA 8270D
2,6-Dichlorophenol	EPA 8270D
2-Chlorophenol	EPA 625.1
	EPA 8270D
2-Methyl-4,6-dinitrophenol	EPA 625.1
	EPA 8270D
2-Methylphenol	EPA 625.1
	EPA 8270D
2-Nitrophenol	EPA 625.1
	EPA 8270D
3-Methylphenol	EPA 8270D
4-Chloro-3-methylphenol	EPA 625.1
	EPA 8270D
4-Methylphenol	EPA 8270D
4-Nitrophenol	EPA 625.1
	EPA 8270D
Pentachlorophenol	EPA 625.1
	EPA 8270D
Phenol	EPA 625.1
	EPA 8270D

Residue

Settleable Solids	SM 2540 F-2011
Solids, Total	SM 2540 B-2011
Solids, Total Dissolved	SM 2540 C-2011

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All approved analytes are listed below:

Residue

Solids, Total Suspended SM 2540 D-2011

Semi-Volatile Organics

1,1'-Biphenyl EPA 8270D
1,2-Dichlorobenzene, Semi-volatile EPA 8270D
1,3-Dichlorobenzene, Semi-volatile EPA 8270D
1,4-Dichlorobenzene, Semi-volatile EPA 8270D
2-Methylnaphthalene EPA 8270D
2-Picoline EPA 8270D
4-Amino biphenyl EPA 8270D
Acetophenone EPA 625.1
EPA 8270D
alpha-Terpineol EPA 625.1
Aramite EPA 8270D
Benzaldehyde EPA 8270D
EPA 8315A
Benzoic Acid EPA 8270D
Benzyl alcohol EPA 8270D
Caprolactam EPA 8270D
Dibenzofuran EPA 8270D
Ethyl methanesulfonate EPA 8270D
Isosafrole EPA 8270D
Methyl methanesulfonate EPA 8270D
n-Decane EPA 625.1
n-Octadecane EPA 625.1
O,O,O-Triethyl phosphorothioate EPA 8270D

Semi-Volatile Organics

p-Dimethylaminoazobenzene EPA 8270D
Phenacetin EPA 8270D
Safrole EPA 8270D

Volatile Aromatics

1,2,4-Trichlorobenzene, Volatile EPA 8260C
1,2,4-Trimethylbenzene EPA 8260C
1,2-Dichlorobenzene EPA 8260C
EPA 624.1
1,3,5-Trimethylbenzene EPA 8260C
1,3-Dichlorobenzene EPA 8260C
EPA 624.1
1,4-Dichlorobenzene EPA 8260C
EPA 624.1
2-Chlorotoluene EPA 8260C
4-Chlorotoluene EPA 8260C
Benzene EPA 8260C
EPA 8021B
EPA 624.1
EPA 602
Bromobenzene EPA 8260C
Chlorobenzene EPA 8260C
EPA 624.1
Ethyl benzene EPA 8260C
EPA 8021B
EPA 624.1

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Volatile Aromatics

Ethyl benzene	EPA 602
Isopropylbenzene	EPA 8260C EPA 8021B
m/p-Xylenes	EPA 8260C EPA 624.1 EPA 602
Naphthalene, Volatile	EPA 8260C EPA 624.1
n-Butylbenzene	EPA 8260C
n-Propylbenzene	EPA 8260C
o-Xylene	EPA 8260C EPA 624.1 EPA 602
p-Isopropyltoluene (P-Cymene)	EPA 8260C
sec-Butylbenzene	EPA 8260C
Styrene	EPA 8260C EPA 624.1
tert-Butylbenzene	EPA 8260C
Toluene	EPA 8260C EPA 8021B EPA 624.1 EPA 602
Total Xylenes	EPA 8260C EPA 8021B EPA 624.1 EPA 602

Volatile Chlorinated Organics

Benzyl chloride	EPA 8260C
Epichlorohydrin	EPA 8260C

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260C
1,1,1-Trichloroethane	EPA 8260C EPA 624.1
1,1,2,2-Tetrachloroethane	EPA 8260C EPA 624.1
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 8260C
1,1,2-Trichloroethane	EPA 8260C EPA 624.1
1,1-Dichloroethane	EPA 8260C EPA 624.1
1,1-Dichloroethene	EPA 8260C EPA 624.1
1,1-Dichloropropene	EPA 8260C
1,2,3-Trichloropropane	EPA 8260C
1,2-Dibromo-3-chloropropane	EPA 8260C
1,2-Dibromoethane	EPA 8260C
1,2-Dichloro-1,1,2-Trifluoroethane	EPA 8260C
1,2-Dichloroethane	EPA 8260C EPA 624.1
1,2-Dichloropropane	EPA 8260C EPA 624.1

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Volatile Halocarbons

1,3-Dichloropropane	EPA 8260C
2,2-Dichloropropane	EPA 8260C
2-Chloro-1,3-butadiene (Chloroprene)	EPA 8260C
2-Chloroethylvinyl ether	EPA 8260C
	EPA 624.1
3-Chloropropene (Allyl chloride)	EPA 8260C
Bromochloromethane	EPA 8260C
Bromodichloromethane	EPA 8260C
	EPA 624.1
Bromoform	EPA 8260C
	EPA 624.1
Bromomethane	EPA 8260C
	EPA 624.1
Carbon tetrachloride	EPA 8260C
	EPA 624.1
Chloroethane	EPA 8260C
	EPA 624.1
Chloroform	EPA 8260C
	EPA 624.1
Chloromethane	EPA 8260C
	EPA 624.1
cis-1,2-Dichloroethene	EPA 8260C
	EPA 624.1
cis-1,3-Dichloropropene	EPA 8260C
	EPA 624.1
Dibromochloromethane	EPA 8260C

Volatile Halocarbons

Dibromochloromethane	EPA 624.1
Dibromomethane	EPA 8260C
Dichlorodifluoromethane	EPA 8260C
	EPA 624.1
Hexachlorobutadiene, Volatile	EPA 8260C
Methyl iodide	EPA 8260C
Methylene chloride	EPA 8260C
	EPA 624.1
Tetrachloroethene	EPA 8260C
	EPA 624.1
trans-1,2-Dichloroethene	EPA 8260C
	EPA 624.1
trans-1,3-Dichloropropene	EPA 8260C
	EPA 624.1
trans-1,4-Dichloro-2-butene	EPA 8260C
Trichloroethene	EPA 8260C
	EPA 624.1
Trichlorofluoromethane	EPA 8260C
	EPA 624.1
Vinyl chloride	EPA 8260C
	EPA 624.1

Volatiles Organics

1,4-Dioxane	EPA 8260C
	EPA 8260C SIM
	EPA 8270D

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ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:*

Volatiles Organics

1,4-Dioxane	EPA 8270D SIM
2-Butanone (Methylethyl ketone)	EPA 8260C
2-Hexanone	EPA 8260C
2-Nitropropane	EPA 8260C
4-Methyl-2-Pentanone	EPA 8260C
	EPA 624.1
Acetone	EPA 8260C
	EPA 624.1
Acetonitrile	EPA 1671
	EPA 8260C
	EPA 624.1
Carbon Disulfide	EPA 8260C
Cyclohexane	EPA 8260C
Di-ethyl ether	EPA 8260C
Diethylamine	EPA 1671
Dimethyl sulfoxide	EPA 1671
Ethyl Acetate	EPA 1666
	EPA 8260C
Ethylene Glycol	EPA 8015C
Isobutyl alcohol	EPA 8260C
	EPA 8015D
	EPA 8015C
Isobutyraldehyde	EPA 1666
Isopropanol	EPA 8260C
Isopropyl Acetate	EPA 1666
Methanol	EPA 1671

Volatiles Organics

Methanol	EPA 8015D
	EPA 8015C
Methyl acetate	EPA 8260C
Methyl cellosolve (2-Methoxyethanol)	EPA 1671
Methyl cyclohexane	EPA 8260C
Methyl formate	EPA 1666
n-Amyl Acetate	EPA 1666
n-Amyl alcohol	EPA 1666
n-Butanol	EPA 8260C
n-Butyl Acetate	EPA 1666
n-Propanol	EPA 1671
o-Toluidine	EPA 8270D
Tetrahydrofuran	EPA 1666
	EPA 8260C
	EPA 624.1
Triethylamine	EPA 1671
Vinyl acetate	EPA 8260C
	EPA 624.1

Sample Preparation Methods

SM 4500-P B(5)-2011
EPA 5030C
EPA 200.2
EPA 3010A
EPA 3005A
EPA 3510C

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Sample Preparation Methods

EPA 3520C
EPA 3020A
SM 4500-NH3 B-2011
SM 4500-F B-2011

NEW
YORK
STATE

Department
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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Acrylates

Acrolein (Propenal)	EPA 8260C
Acrylonitrile	EPA 8260C
Ethyl methacrylate	EPA 8260C
Methyl acrylonitrile	EPA 8260C
Methyl methacrylate	EPA 8260C

Amines

1,2-Diphenylhydrazine	EPA 8270D
1,4-Phenylenediamine	EPA 8270D
1-Naphthylamine	EPA 8270D
2-Naphthylamine	EPA 8270D
2-Nitroaniline	EPA 8270D
3-Nitroaniline	EPA 8270D
4,4'-Methylenebis(2-chloroaniline)	EPA 8270D
4-Chloroaniline	EPA 8270D
4-Nitroaniline	EPA 8270D
5-Nitro-o-toluidine	EPA 8270D
a,a-Dimethylphenethylamine	EPA 8270D
Aniline	EPA 8270D
Carbazole	EPA 8270D
Diphenylamine	EPA 8270D
Methapyrilene	EPA 8270D
Pronamide	EPA 8270D

Benzidines

3,3'-Dichlorobenzidine	EPA 8270D
3,3'-Dimethylbenzidine	EPA 8270D

Benzidines

Benzidine	EPA 8270D
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Carbamate Pesticides

Aldicarb	EPA 8318A
Aldicarb Sulfone	EPA 8318A
Carbofuran	EPA 8318A

Characteristic Testing

Corrosivity	EPA 9045D
Free Liquids	EPA 9095B
Ignitability	EPA 1010A
Synthetic Precipitation Leaching Proc.	EPA 1312
TCLP	EPA 1311

Chlorinated Hydrocarbon Pesticides

2,4'-DDD (Mitotane)	EPA 8081B
4,4'-DDD	EPA 8081B
4,4'-DDE	EPA 8081B
4,4'-DDT	EPA 8081B
Aldrin	EPA 8081B
alpha-BHC	EPA 8081B
alpha-Chlordane	EPA 8081B
Atrazine	EPA 8270D
beta-BHC	EPA 8081B
Chlordane Total	EPA 8081B
Chlorobenzilate	EPA 8270D
delta-BHC	EPA 8081B

Serial No.: 59377

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Chlorinated Hydrocarbon Pesticides

Diallate	EPA 8270D
Dieldrin	EPA 8081B
Endosulfan I	EPA 8081B
Endosulfan II	EPA 8081B
Endosulfan sulfate	EPA 8081B
Endrin	EPA 8081B
Endrin aldehyde	EPA 8081B
Endrin Ketone	EPA 8081B
gamma-Chlordane	EPA 8081B
Heptachlor	EPA 8081B
Heptachlor epoxide	EPA 8081B
Isodrin	EPA 8270D
Kepone	EPA 8081B
Lindane	EPA 8081B
Methoxychlor	EPA 8081B
Mirex	EPA 8081B
Pentachloronitrobenzene	EPA 8270D
Simazine	EPA 8141B
Toxaphene	EPA 8081B

Chlorinated Hydrocarbons

1,2,3-Trichlorobenzene	EPA 8260C
1,2,4,5-Tetrachlorobenzene	EPA 8270D
1,2,4-Trichlorobenzene	EPA 8270D
1-Chloronaphthalene	EPA 8270D

Chlorinated Hydrocarbons

2-Chloronaphthalene	EPA 8270D
Hexachlorobenzene	EPA 8270D
Hexachlorobutadiene	EPA 8270D
Hexachlorocyclopentadiene	EPA 8270D
Hexachloroethane	EPA 8270D
Hexachloropropene	EPA 8270D
Pentachlorobenzene	EPA 8270D

Chlorophenoxy Acid Pesticides

2,4,5-T	EPA 8151A
2,4,5-TP (Silvex)	EPA 8151A
2,4-D	EPA 8151A
2,4-DB	EPA 8151A
Dalapon	EPA 8151A
Dicamba	EPA 8151A
Dichloroprop	EPA 8151A
Dinoseb	EPA 8151A
MCPA	EPA 8151A
MCPP	EPA 8151A
Pentachlorophenol	EPA 8151A

Dioxins and Furans

1,2,3,4,6,7,8,9-Octachlorodibenzofuran	EPA 8290A
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-diox	EPA 8290A
1,2,3,4,6,7,8-Heptachlorodibenzofuran	EPA 8290A
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	EPA 8290A
1,2,3,4,7,8,9-Heptachlorodibenzofuran	EPA 8290A

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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:*

Dioxins and Furans

1,2,3,4,7,8-Hexachlorodibenzofuran	EPA 8290A
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	EPA 8290A
1,2,3,6,7,8-Hexachlorodibenzofuran	EPA 8290A
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	EPA 8290A
1,2,3,7,8,9-Hexachlorodibenzofuran	EPA 8290A
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	EPA 8290A
1,2,3,7,8-Pentachlorodibenzofuran	EPA 8290A
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	EPA 8290A
2,3,4,6,7,8-Hexachlorodibenzofuran	EPA 8290A
2,3,4,7,8-Pentachlorodibenzofuran	EPA 8290A
2,3,7,8-Tetrachlorodibenzofuran	EPA 8290A
2,3,7,8-Tetrachlorodibenzo-p-dioxin	EPA 8290A

Haloethers

2,2'-Oxybis(1-chloropropane)	EPA 8270D
4-Bromophenylphenyl ether	EPA 8270D
4-Chlorophenylphenyl ether	EPA 8270D
Bis(2-chloroethoxy)methane	EPA 8270D
Bis(2-chloroethyl)ether	EPA 8270D

Low Level Polynuclear Aromatic Hydrocarbons

Acenaphthene Low Level	EPA 8270D SIM
Acenaphthylene Low Level	EPA 8270D SIM
Anthracene Low Level	EPA 8270D SIM
Benzo(a)anthracene Low Level	EPA 8270D SIM
Benzo(a)pyrene Low Level	EPA 8270D SIM
Benzo(b)fluoranthene Low Level	EPA 8270D SIM

Low Level Polynuclear Aromatic Hydrocarbons

Benzo(g,h,i)perylene Low Level	EPA 8270D SIM
Benzo(k)fluoranthene Low Level	EPA 8270D SIM
Chrysene Low Level	EPA 8270D SIM
Dibenzo(a,h)anthracene Low Level	EPA 8270D SIM
Fluoranthene Low Level	EPA 8270D SIM
Fluorene Low Level	EPA 8270D SIM
Indeno(1,2,3-cd)pyrene Low Level	EPA 8270D SIM
Naphthalene Low Level	EPA 8270D SIM
Phenanthrene Low Level	EPA 8270D SIM
Pyrene Low Level	EPA 8270D SIM

Metals I

Barium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Cadmium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Calcium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Chromium, Total	EPA 6010C
	EPA 6010D

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Metals I

Chromium, Total	EPA 6020A
	EPA 6020B
Copper, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Iron, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Lead, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Magnesium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Manganese, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Nickel, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B

Metals I

Potassium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Silver, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Sodium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Strontium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B

Metals II

Aluminum, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Antimony, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B

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Metals II

Arsenic, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Beryllium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Chromium VI	EPA 7196A
	EPA 7199
Lithium, Total	EPA 6010C
	EPA 6010D
Mercury, Total	EPA 7471B
Selenium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Vanadium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Zinc, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B

Metals III

Cobalt, Total	EPA 6010C
	EPA 6020A
Molybdenum, Total	EPA 6010C
	EPA 6020A
Silica, Dissolved	EPA 6010C
Thallium, Total	EPA 6010C
	EPA 6020A
Tin, Total	EPA 6010C
	EPA 6020A
Titanium, Total	EPA 6010C
	EPA 6020A

Minerals

Bromide	EPA 9056A
Chloride	EPA 9056A
Fluoride, Total	EPA 9056A
Sulfate (as SO ₄)	EPA 9056A

Miscellaneous

Boron, Total	EPA 6010C
	EPA 6010D
Cyanide, Total	EPA 9012B
Formaldehyde	EPA 8315A
Organic Carbon, Total	Lloyd Kahn Method
	EPA 9060A
Perchlorate	EPA 6850
Phenols	EPA 9066

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Miscellaneous

Specific Conductance EPA 9050A

Nitroaromatics and Isophorone

1,2-Dinitrobenzene EPA 8270D
1,3,5-Trinitrobenzene EPA 8270D
EPA 8330A
1,3-Dinitrobenzene EPA 8270D
EPA 8330A
1,4-Dinitrobenzene EPA 8270D
1,4-Naphthoquinone EPA 8270D
2,4,6-Trinitrotoluene EPA 8330A
EPA 8330B
2,4-Dinitrotoluene EPA 8270D
EPA 8330A
EPA 8330B
2,6-Dinitrotoluene EPA 8270D
EPA 8330A
EPA 8330B
2-Amino-4,6-dinitrotoluene EPA 8330A
2-Nitrotoluene EPA 8330A
3,5-Dinitroaniline EPA 8330B
3-Nitrotoluene EPA 8330A
4-Amino-2,6-dinitrotoluene EPA 8330A
4-Dimethylaminoazobenzene EPA 8270D
4-Nitroquinoline-1-oxide EPA 8270D
4-Nitrotoluene EPA 8330A

Nitroaromatics and Isophorone

Hexahydro-1,3,5-trinitro-1,3,5-triazine EPA 8330A
Isophorone EPA 8270D
Methyl-2,4,6-trinitrophenylnitramine EPA 8330A
Nitrobenzene EPA 8270D
EPA 8330A
Nitroglycerine EPA 8330B
Octahydro-tetranitro-tetrazocine EPA 8330A
Pentaerythritol tetranitrate EPA 8330B
Pyridine EPA 8270D

Nitrosoamines

N-Nitrosodiethylamine EPA 8270D
N-Nitrosodimethylamine EPA 8270D
N-Nitrosodi-n-butylamine EPA 8270D
N-Nitrosodi-n-propylamine EPA 8270D
N-Nitrosodiphenylamine EPA 8270D
N-nitrosomethylethylamine EPA 8270D
N-nitrosomorpholine EPA 8270D
N-nitrosopiperidine EPA 8270D
N-Nitrosopyrrolidine EPA 8270D

Nutrients

Nitrate (as N) EPA 9056A
Nitrite (as N) EPA 9056A

Organophosphate Pesticides

Azinphos methyl EPA 8141B

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Organophosphate Pesticides

Bolstar	EPA 8141B
Carbophenothion	EPA 8141B
Chlorpyrifos	EPA 8141B
Coumaphos	EPA 8141B
Demeton-O	EPA 8141B
Demeton-S	EPA 8141B
Diazinon	EPA 8141B
Dichlorvos	EPA 8141B
Dimethoate	EPA 8270D
Disulfoton	EPA 8141B
	EPA 8270D
EPN	EPA 8141B
Ethion	EPA 8141B
Ethoprop	EPA 8141B
Famphur	EPA 8141B
	EPA 8270D
Fensulfothion	EPA 8141B
Fenthion	EPA 8141B
Malathion	EPA 8141B
Mevinphos	EPA 8141B
NALED	EPA 8141B
Parathion ethyl	EPA 8141B
	EPA 8270D
Parathion methyl	EPA 8141B
	EPA 8270D
Phorate	EPA 8141B

Organophosphate Pesticides

Phorate	EPA 8270D
Ronnel	EPA 8141B
Sulfotepp	EPA 8270D
Thionazin	EPA 8270D
Tokuthion	EPA 8141B
Trichloronate	EPA 8141B

Petroleum Hydrocarbons

Diesel Range Organics	EPA 8015D
	EPA 8015C
Gasoline Range Organics	EPA 8015D
	EPA 8015C
Oil and Grease Total Recoverable (HEM)	EPA 9071B (Solvent:Hexane)

Phthalate Esters

Benzyl butyl phthalate	EPA 8270D
Bis(2-ethylhexyl) phthalate	EPA 8270D
Diethyl phthalate	EPA 8270D
Dimethyl phthalate	EPA 8270D
Di-n-butyl phthalate	EPA 8270D
Di-n-octyl phthalate	EPA 8270D

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
PCB 1	EPA 1668A
	EPA 1668C
PCB 10	EPA 1668A
	EPA 1668C
PCB 100	EPA 1668A
	EPA 1668C
PCB 101	EPA 1668A
	EPA 1668C
PCB 102	EPA 1668A
	EPA 1668C
PCB 103	EPA 1668A
	EPA 1668C
PCB 104	EPA 1668A
	EPA 1668C
PCB 105	EPA 1668A
	EPA 1668C
PCB 106	EPA 1668A
	EPA 1668C
PCB 107	EPA 1668A
	EPA 1668C
PCB 108	EPA 1668A

PCB 108	EPA 1668C
PCB 109	EPA 1668A
	EPA 1668C
PCB 11	EPA 1668A
	EPA 1668C
PCB 110	EPA 1668A
	EPA 1668C
PCB 111	EPA 1668A
	EPA 1668C
PCB 112	EPA 1668A
	EPA 1668C
PCB 113	EPA 1668A
	EPA 1668C
PCB 114	EPA 1668A
	EPA 1668C
PCB 115	EPA 1668A
	EPA 1668C
PCB 116	EPA 1668A
	EPA 1668C
PCB 117	EPA 1668A
	EPA 1668C
PCB 118	EPA 1668A
	EPA 1668C
PCB 119	EPA 1668A
	EPA 1668C
PCB 12	EPA 1668A

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

PCB 12	EPA 1668C
PCB 120	EPA 1668A
	EPA 1668C
PCB 121	EPA 1668A
	EPA 1668C
PCB 122	EPA 1668A
	EPA 1668C
PCB 123	EPA 1668A
	EPA 1668C
PCB 124	EPA 1668A
	EPA 1668C
PCB 125	EPA 1668A
	EPA 1668C
PCB 126	EPA 1668A
	EPA 1668C
PCB 127	EPA 1668A
	EPA 1668C
PCB 128	EPA 1668A
	EPA 1668C
PCB 129	EPA 1668A
	EPA 1668C
PCB 13	EPA 1668A
	EPA 1668C
PCB 130	EPA 1668A
	EPA 1668C
PCB 131	EPA 1668A

PCB 131	EPA 1668C
PCB 132	EPA 1668A
	EPA 1668C
PCB 133	EPA 1668A
	EPA 1668C
PCB 134	EPA 1668A
	EPA 1668C
PCB 135	EPA 1668A
	EPA 1668C
PCB 136	EPA 1668A
	EPA 1668C
PCB 137	EPA 1668A
	EPA 1668C
PCB 138	EPA 1668A
	EPA 1668C
PCB 139	EPA 1668A
	EPA 1668C
PCB 14	EPA 1668A
	EPA 1668C
PCB 140	EPA 1668A
	EPA 1668C
PCB 141	EPA 1668A
	EPA 1668C
PCB 142	EPA 1668A
	EPA 1668C
PCB 143	EPA 1668A

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

PCB 143	EPA 1668C
PCB 144	EPA 1668A
	EPA 1668C
PCB 145	EPA 1668A
	EPA 1668C
PCB 146	EPA 1668A
	EPA 1668C
PCB 147	EPA 1668A
	EPA 1668C
PCB 148	EPA 1668A
	EPA 1668C
PCB 149	EPA 1668A
	EPA 1668C
PCB 15	EPA 1668A
	EPA 1668C
PCB 150	EPA 1668A
	EPA 1668C
PCB 151	EPA 1668A
	EPA 1668C
PCB 152	EPA 1668A
	EPA 1668C
PCB 153	EPA 1668A
	EPA 1668C
PCB 154	EPA 1668A
	EPA 1668C
PCB 155	EPA 1668A

PCB 155	EPA 1668C
PCB 156	EPA 1668A
	EPA 1668C
PCB 157	EPA 1668A
	EPA 1668C
PCB 158	EPA 1668A
	EPA 1668C
PCB 159	EPA 1668A
	EPA 1668C
PCB 16	EPA 1668A
	EPA 1668C
PCB 160	EPA 1668A
	EPA 1668C
PCB 161	EPA 1668A
	EPA 1668C
PCB 162	EPA 1668A
	EPA 1668C
PCB 163	EPA 1668A
	EPA 1668C
PCB 164	EPA 1668A
	EPA 1668C
PCB 165	EPA 1668A
	EPA 1668C
PCB 166	EPA 1668A
	EPA 1668C
PCB 167	EPA 1668A

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WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

*is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:*

Polychlorinated Biphenyls

PCB 167	EPA 1668C
PCB 168	EPA 1668A
	EPA 1668C
PCB 169	EPA 1668A
	EPA 1668C
PCB 17	EPA 1668A
	EPA 1668C
PCB 170	EPA 1668A
	EPA 1668C
PCB 171	EPA 1668A
	EPA 1668C
PCB 172	EPA 1668A
	EPA 1668C
PCB 173	EPA 1668A
	EPA 1668C
PCB 174	EPA 1668A
	EPA 1668C
PCB 175	EPA 1668A
	EPA 1668C
PCB 176	EPA 1668A
	EPA 1668C
PCB 177	EPA 1668A
	EPA 1668C
PCB 178	EPA 1668A
	EPA 1668C
PCB 179	EPA 1668A

Polychlorinated Biphenyls

PCB 179	EPA 1668C
PCB 18	EPA 1668A
	EPA 1668C
PCB 180	EPA 1668A
	EPA 1668C
PCB 181	EPA 1668A
	EPA 1668C
PCB 182	EPA 1668A
	EPA 1668C
PCB 183	EPA 1668A
	EPA 1668C
PCB 184	EPA 1668A
	EPA 1668C
PCB 185	EPA 1668A
	EPA 1668C
PCB 186	EPA 1668A
	EPA 1668C
PCB 187	EPA 1668A
	EPA 1668C
PCB 188	EPA 1668A
	EPA 1668C
PCB 189	EPA 1668A
	EPA 1668C
PCB 19	EPA 1668A
	EPA 1668C
PCB 190	EPA 1668A

Serial No.: 59377

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

PCB 190	EPA 1668C
PCB 191	EPA 1668A
	EPA 1668C
PCB 192	EPA 1668A
	EPA 1668C
PCB 193	EPA 1668A
	EPA 1668C
PCB 194	EPA 1668A
	EPA 1668C
PCB 195	EPA 1668A
	EPA 1668C
PCB 196	EPA 1668A
	EPA 1668C
PCB 197	EPA 1668A
	EPA 1668C
PCB 198	EPA 1668A
	EPA 1668C
PCB 199	EPA 1668A
	EPA 1668C
PCB 2	EPA 1668A
	EPA 1668C
PCB 20	EPA 1668A
	EPA 1668C
PCB 200	EPA 1668A
	EPA 1668C
PCB 201	EPA 1668A

PCB 201	EPA 1668C
PCB 202	EPA 1668A
	EPA 1668C
PCB 203	EPA 1668A
	EPA 1668C
PCB 204	EPA 1668A
	EPA 1668C
PCB 205	EPA 1668A
	EPA 1668C
PCB 206	EPA 1668A
	EPA 1668C
PCB 207	EPA 1668A
	EPA 1668C
PCB 208	EPA 1668A
	EPA 1668C
PCB 209	EPA 1668A
	EPA 1668C
PCB 21	EPA 1668A
	EPA 1668C
PCB 22	EPA 1668A
	EPA 1668C
PCB 23	EPA 1668A
	EPA 1668C
PCB 24	EPA 1668A
	EPA 1668C
PCB 25	EPA 1668A

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

PCB 25	EPA 1668C
PCB 26	EPA 1668A
	EPA 1668C
PCB 27	EPA 1668A
	EPA 1668C
PCB 28	EPA 1668A
	EPA 1668C
PCB 29	EPA 1668A
	EPA 1668C
PCB 3	EPA 1668A
	EPA 1668C
PCB 30	EPA 1668A
	EPA 1668C
PCB 31	EPA 1668A
	EPA 1668C
PCB 32	EPA 1668A
	EPA 1668C
PCB 33	EPA 1668A
	EPA 1668C
PCB 34	EPA 1668A
	EPA 1668C
PCB 35	EPA 1668A
	EPA 1668C
PCB 36	EPA 1668A
	EPA 1668C
PCB 37	EPA 1668A

PCB 37	EPA 1668C
PCB 38	EPA 1668A
	EPA 1668C
PCB 39	EPA 1668A
	EPA 1668C
PCB 4	EPA 1668A
	EPA 1668C
PCB 40	EPA 1668A
	EPA 1668C
PCB 41	EPA 1668A
	EPA 1668C
PCB 42	EPA 1668A
	EPA 1668C
PCB 43	EPA 1668A
	EPA 1668C
PCB 44	EPA 1668A
	EPA 1668C
PCB 45	EPA 1668A
	EPA 1668C
PCB 46	EPA 1668A
	EPA 1668C
PCB 47	EPA 1668A
	EPA 1668C
PCB 48	EPA 1668A
	EPA 1668C
PCB 49	EPA 1668A

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Polychlorinated Biphenyls

PCB 49	EPA 1668C
PCB 5	EPA 1668A
	EPA 1668C
PCB 50	EPA 1668A
	EPA 1668C
PCB 51	EPA 1668A
	EPA 1668C
PCB 52	EPA 1668A
	EPA 1668C
PCB 53	EPA 1668A
	EPA 1668C
PCB 54	EPA 1668A
	EPA 1668C
PCB 55	EPA 1668A
	EPA 1668C
PCB 56	EPA 1668A
	EPA 1668C
PCB 57	EPA 1668A
	EPA 1668C
PCB 58	EPA 1668A
	EPA 1668C
PCB 59	EPA 1668A
	EPA 1668C
PCB 6	EPA 1668A
	EPA 1668C
PCB 60	EPA 1668A

PCB 60	EPA 1668C
PCB 61	EPA 1668A
	EPA 1668C
PCB 62	EPA 1668A
	EPA 1668C
PCB 63	EPA 1668A
	EPA 1668C
PCB 64	EPA 1668A
	EPA 1668C
PCB 65	EPA 1668A
	EPA 1668C
PCB 66	EPA 1668A
	EPA 1668C
PCB 67	EPA 1668A
	EPA 1668C
PCB 68	EPA 1668A
	EPA 1668C
PCB 69	EPA 1668A
	EPA 1668C
PCB 7	EPA 1668A
	EPA 1668C
PCB 70	EPA 1668A
	EPA 1668C
PCB 71	EPA 1668A
	EPA 1668C
PCB 72	EPA 1668A

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Polychlorinated Biphenyls

Polychlorinated Biphenyls

PCB 72	EPA 1668C
PCB 73	EPA 1668A
	EPA 1668C
PCB 74	EPA 1668A
	EPA 1668C
PCB 75	EPA 1668A
	EPA 1668C
PCB 76	EPA 1668A
	EPA 1668C
PCB 77	EPA 1668A
	EPA 1668C
PCB 78	EPA 1668A
	EPA 1668C
PCB 79	EPA 1668A
	EPA 1668C
PCB 8	EPA 1668A
	EPA 1668C
PCB 80	EPA 1668A
	EPA 1668C
PCB 81	EPA 1668A
	EPA 1668C
PCB 82	EPA 1668A
	EPA 1668C
PCB 83	EPA 1668A
	EPA 1668C
PCB 84	EPA 1668A

PCB 84	EPA 1668C
PCB 85	EPA 1668A
	EPA 1668C
PCB 86	EPA 1668A
	EPA 1668C
PCB 87	EPA 1668A
	EPA 1668C
PCB 88	EPA 1668A
	EPA 1668C
PCB 89	EPA 1668A
	EPA 1668C
PCB 9	EPA 1668A
	EPA 1668C
PCB 90	EPA 1668A
	EPA 1668C
PCB 91	EPA 1668A
	EPA 1668C
PCB 92	EPA 1668A
	EPA 1668C
PCB 93	EPA 1668A
	EPA 1668C
PCB 94	EPA 1668A
	EPA 1668C
PCB 95	EPA 1668A
	EPA 1668C
PCB 96	EPA 1668A

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Polychlorinated Biphenyls

PCB 96	EPA 1668C
PCB 97	EPA 1668A
	EPA 1668C
PCB 98	EPA 1668A
	EPA 1668C
PCB 99	EPA 1668A
	EPA 1668C
PCB Congeners, Total	EPA 1668C

Polynuclear Aromatic Hydrocarbons

2-Acetylaminofluorene	EPA 8270D
3-Methylcholanthrene	EPA 8270D
7,12-Dimethylbenzyl (a) anthracene	EPA 8270D
Acenaphthene	EPA 8270D
Acenaphthylene	EPA 8270D
Anthracene	EPA 8270D
Benzo(a)anthracene	EPA 8270D
Benzo(a)pyrene	EPA 8270D
Benzo(b)fluoranthene	EPA 8270D
Benzo(g,h,i)perylene	EPA 8270D
Benzo(k)fluoranthene	EPA 8270D
Chrysene	EPA 8270D
Dibenzo(a,h)anthracene	EPA 8270D
Dibenzo(a,j)acridine	EPA 8270D
Fluoranthene	EPA 8270D
Fluorene	EPA 8270D

Polynuclear Aromatic Hydrocarbons

Indeno(1,2,3-cd)pyrene	EPA 8270D
Naphthalene	EPA 8270D
Phenanthrene	EPA 8270D
Pyrene	EPA 8270D

Priority Pollutant Phenols

2,3,4,6 Tetrachlorophenol	EPA 8270D
2,4,5-Trichlorophenol	EPA 8270D
2,4,6-Trichlorophenol	EPA 8270D
2,4-Dichlorophenol	EPA 8270D
2,4-Dimethylphenol	EPA 8270D
2,4-Dinitrophenol	EPA 8270D
2,6-Dichlorophenol	EPA 8270D
2-Chlorophenol	EPA 8270D
2-Methyl-4,6-dinitrophenol	EPA 8270D
2-Methylphenol	EPA 8270D
2-Nitrophenol	EPA 8270D
3-Methylphenol	EPA 8270D
4-Chloro-3-methylphenol	EPA 8270D
4-Methylphenol	EPA 8270D
4-Nitrophenol	EPA 8270D
Pentachlorophenol	EPA 8270D
Phenol	EPA 8270D

Semi-Volatile Organics

1,1'-Biphenyl	EPA 8270D
1,2-Dichlorobenzene, Semi-volatile	EPA 8270D

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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Semi-Volatile Organics

1,3-Dichlorobenzene, Semi-volatile	EPA 8270D
1,4-Dichlorobenzene, Semi-volatile	EPA 8270D
2-Methylnaphthalene	EPA 8270D
2-Picoline	EPA 8270D
4-Amino biphenyl	EPA 8270D
Acetophenone	EPA 8270D
Aramite	EPA 8270D
Benzaldehyde	EPA 8270D
	EPA 8315A
Benzoic Acid	EPA 8270D
Benzyl alcohol	EPA 8270D
Caprolactam	EPA 8270D
Dibenzofuran	EPA 8270D
Ethyl methanesulfonate	EPA 8270D
Isosafrole	EPA 8270D
Methyl methanesulfonate	EPA 8270D
O,O,O-Triethyl phosphorothioate	EPA 8270D
Phenacetin	EPA 8270D
Safrole	EPA 8270D

Volatile Aromatics

1,2,4-Trichlorobenzene, Volatile	EPA 8260C
1,2,4-Trimethylbenzene	EPA 8260C
1,2-Dichlorobenzene	EPA 8260C
1,3,5-Trimethylbenzene	EPA 8260C
1,3-Dichlorobenzene	EPA 8260C

Volatile Aromatics

1,4-Dichlorobenzene	EPA 8260C
2-Chlorotoluene	EPA 8260C
4-Chlorotoluene	EPA 8260C
Benzene	EPA 8260C
	EPA 8021B
Bromobenzene	EPA 8260C
Chlorobenzene	EPA 8260C
Ethyl benzene	EPA 8260C
	EPA 8021B
Isopropylbenzene	EPA 8260C
	EPA 8021B
m/p-Xylenes	EPA 8260C
Naphthalene, Volatile	EPA 8260C
	EPA 8021B
n-Butylbenzene	EPA 8260C
n-Propylbenzene	EPA 8260C
o-Xylene	EPA 8260C
	EPA 8021B
p-Isopropyltoluene (P-Cymene)	EPA 8260C
sec-Butylbenzene	EPA 8260C
Styrene	EPA 8260C
tert-Butylbenzene	EPA 8260C
Toluene	EPA 8260C
	EPA 8021B
Total Xylenes	EPA 8260C
	EPA 8021B

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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Volatile Chlorinated Organics

Benzyl chloride	EPA 8260C
Epichlorohydrin	EPA 8260C

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260C
1,1,1-Trichloroethane	EPA 8260C
1,1,2,2-Tetrachloroethane	EPA 8260C
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 8260C
1,1,2-Trichloroethane	EPA 8260C
1,1-Dichloroethane	EPA 8260C
1,1-Dichloroethene	EPA 8260C
1,1-Dichloropropene	EPA 8260C
1,2,3-Trichloropropane	EPA 8260C
1,2-Dibromo-3-chloropropane	EPA 8260C
1,2-Dibromoethane	EPA 8260C
1,2-Dichloroethane	EPA 8260C
1,2-Dichloropropane	EPA 8260C
1,3-Dichloropropane	EPA 8260C
2,2-Dichloropropane	EPA 8260C
2-Chloro-1,3-butadiene (Chloroprene)	EPA 8260C
2-Chloroethylvinyl ether	EPA 8260C
3-Chloropropene (Allyl chloride)	EPA 8260C
Bromochloromethane	EPA 8260C
Bromodichloromethane	EPA 8260C
Bromoform	EPA 8260C
Bromomethane	EPA 8260C

Volatile Halocarbons

Carbon tetrachloride	EPA 8260C
Chloroethane	EPA 8260C
Chloroform	EPA 8260C
Chloromethane	EPA 8260C
cis-1,2-Dichloroethene	EPA 8260C
cis-1,3-Dichloropropene	EPA 8260C
Dibromochloromethane	EPA 8260C
Dibromomethane	EPA 8260C
Dichlorodifluoromethane	EPA 8260C
Hexachlorobutadiene, Volatile	EPA 8260C
Methyl iodide	EPA 8260C
Methylene chloride	EPA 8260C
Tetrachloroethene	EPA 8260C
trans-1,2-Dichloroethene	EPA 8260C
trans-1,3-Dichloropropene	EPA 8260C
trans-1,4-Dichloro-2-butene	EPA 8260C
Trichloroethene	EPA 8260C
Trichlorofluoromethane	EPA 8260C
Vinyl chloride	EPA 8260C

Volatile Organics

1,4-Dioxane	EPA 8260C
	EPA 8260C SIM
	EPA 8270D
	EPA 8270D SIM
2-Butanone (Methylethyl ketone)	EPA 8260C

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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
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Volatile Organics

Sample Preparation Methods

2-Hexanone	EPA 8260C
2-Nitropropane	EPA 8260C
4-Methyl-2-Pentanone	EPA 8260C
Acetone	EPA 8260C
Acetonitrile	EPA 8260C
Carbon Disulfide	EPA 8260C
Cyclohexane	EPA 8260C
Ethyl Acetate	EPA 8260C
Ethylene Glycol	EPA 8015C
Isobutyl alcohol	EPA 8260C
Isopropanol	EPA 8260C
Methyl acetate	EPA 8260C
Methyl cyclohexane	EPA 8260C
Methyl tert-butyl ether	EPA 8260C
n-Butanol	EPA 8260C
o-Toluidine	EPA 8270D
Propionitrile	EPA 8260C
tert-butyl alcohol	EPA 8260C
Vinyl acetate	EPA 8260C

EPA 3050B
EPA 3550C
EPA 3540C
EPA 3020A
EPA 3546
EPA 5035
EPA 3060A

Sample Preparation Methods

EPA 5035A-L
EPA 5035A-H
EPA 3010A
EPA 3005A

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ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
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Acrylates

Acetonitrile	EPA TO-15
Acrylonitrile	EPA TO-15
Ethyl acrylate	EPA TO-15
Methyl methacrylate	EPA TO-15

Chlorinated Hydrocarbons

1,2,4-Trichlorobenzene	EPA TO-14A
	EPA TO-15
Hexachlorobutadiene	EPA TO-14A
	EPA TO-15
Hexachloroethane	EPA TO-15

Polynuclear Aromatics

Naphthalene	EPA TO-15
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Purgeable Aromatics

1,2,4-Trimethylbenzene	EPA TO-14A
	EPA TO-15
1,2-Dichlorobenzene	EPA TO-14A
	EPA TO-15
1,3,5-Trimethylbenzene	EPA TO-14A
	EPA TO-15
1,3-Dichlorobenzene	EPA TO-14A
	EPA TO-15
1,4-Dichlorobenzene	EPA TO-14A
	EPA TO-15
2-Chlorotoluene	EPA TO-15

Purgeable Aromatics

Benzene	EPA TO-14A
	EPA TO-15
Chlorobenzene	EPA TO-14A
	EPA TO-15
Ethyl benzene	EPA TO-14A
	EPA TO-15
Isopropylbenzene	EPA TO-15
m/p-Xylenes	EPA TO-15
o-Xylene	EPA TO-15
Styrene	EPA TO-14A
	EPA TO-15
Toluene	EPA TO-14A
	EPA TO-15
Total Xylenes	EPA TO-14A
	EPA TO-15

Purgeable Halocarbons

1,1,1-Trichloroethane	EPA TO-14A
	EPA TO-15
1,1,2,2-Tetrachloroethane	EPA TO-14A
	EPA TO-15
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA TO-14A
	EPA TO-15
1,1,2-Trichloroethane	EPA TO-14A
	EPA TO-15
1,1-Dichloroethane	EPA TO-14A

Serial No.: 59378

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DUANE LUCKENBILL
EUROFINS LANCASTER LABORATORIES
ENVIRONMENTAL LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601-5994

NY Lab Id No: 10670

*is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved analytes are listed below:*

Purgeable Halocarbons

1,1-Dichloroethane	EPA TO-15
1,1-Dichloroethene	EPA TO-14A
	EPA TO-15
1,2-Dibromo-3-chloropropane	EPA TO-15
1,2-Dibromoethane	EPA TO-14A
	EPA TO-15
1,2-Dichloroethane	EPA TO-14A
	EPA TO-15
1,2-Dichloropropane	EPA TO-14A
	EPA TO-15
3-Chloropropene (Allyl chloride)	EPA TO-15
Bromodichloromethane	EPA TO-14A
	EPA TO-15
Bromoform	EPA TO-15
Bromomethane	EPA TO-14A
	EPA TO-15
Carbon tetrachloride	EPA TO-14A
	EPA TO-15
Chloroethane	EPA TO-14A
	EPA TO-15
Chloroform	EPA TO-14A
	EPA TO-15
Chloromethane	EPA TO-14A
	EPA TO-15
cis-1,2-Dichloroethene	EPA TO-14A
	EPA TO-15

Purgeable Halocarbons

cis-1,3-Dichloropropene	EPA TO-14A
	EPA TO-15
Dibromochloromethane	EPA TO-15
Dichlorodifluoromethane	EPA TO-14A
	EPA TO-15
Methylene chloride	EPA TO-14A
	EPA TO-15
Tetrachloroethene	EPA TO-14A
	EPA TO-15
trans-1,2-Dichloroethene	EPA TO-14A
	EPA TO-15
trans-1,3-Dichloropropene	EPA TO-14A
	EPA TO-15
Trichloroethene	EPA TO-14A
	EPA TO-15
Trichlorofluoromethane	EPA TO-14A
	EPA TO-15
Vinyl bromide	EPA TO-15
Vinyl chloride	EPA TO-14A
	EPA TO-15

Volatile Chlorinated Organics

Benzyl chloride	EPA TO-14A
	EPA TO-15

Volatile Organics

1,2-Dichlorotetrafluoroethane	EPA TO-14A
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ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved analytes are listed below:*

Volatile Organics

1,2-Dichlorotetrafluoroethane	EPA TO-15
1,3-Butadiene	EPA TO-15
1,4-Dioxane	EPA TO-15
2,2,4-Trimethylpentane	EPA TO-15
2-Butanone (Methylethyl ketone)	EPA TO-15
4-Methyl-2-Pentanone	EPA TO-15
Acetone	EPA TO-15
Acrolein (Propenal)	EPA TO-15
Carbon Disulfide	EPA TO-15
Cyclohexane	EPA TO-15
Hexane	EPA TO-15
Isopropanol	EPA TO-15
Methyl iodide	EPA TO-15
Methyl tert-butyl ether	EPA TO-15
n-Heptane	EPA TO-15
tert-butyl alcohol	EPA TO-15
Vinyl acetate	EPA TO-15

NEW
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MS. HEIDI HAYES
EUROFINS AIR TOXICS, LLC
180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630

NY Lab Id No: 11291

*is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved analytes are listed below:*

Chlorinated Hydrocarbons

1,2,4-Trichlorobenzene

EPA TO-17
EPA TO-14A
EPA TO-15

Hexachlorobutadiene

EPA TO-17
EPA TO-14A
EPA TO-15

Polynuclear Aromatics

Acenaphthene

EPA TO-13A

Acenaphthylene

EPA TO-13A

Anthracene

EPA TO-13A

Benzo(a)anthracene

EPA TO-13A

Benzo(a)pyrene

EPA TO-13A

Benzo(b)fluoranthene

EPA TO-13A

Benzo(g,h,i)perylene

EPA TO-13A

Benzo(k)fluoranthene

EPA TO-13A

Chrysene

EPA TO-13A

Dibenzo(a,h)anthracene

EPA TO-13A

Fluoranthene

EPA TO-13A

Fluorene

EPA TO-13A

Indeno(1,2,3-cd)pyrene

EPA TO-13A

Naphthalene

EPA TO-13A
EPA TO-17
EPA TO-14A
EPA TO-15

Phenanthrene

EPA TO-13A

Polynuclear Aromatics

Pyrene

EPA TO-13A

Purgeable Aromatics

1,2,4-Trimethylbenzene

EPA TO-17
EPA TO-14A
EPA TO-15

1,2-Dichlorobenzene

EPA TO-17
EPA TO-14A
EPA TO-15

1,3,5-Trimethylbenzene

EPA TO-17
EPA TO-14A
EPA TO-15

1,3-Dichlorobenzene

EPA TO-17
EPA TO-14A
EPA TO-15

1,4-Dichlorobenzene

EPA TO-17
EPA TO-14A
EPA TO-15

Benzene

EPA TO-17
EPA TO-14A
EPA TO-15

Chlorobenzene

EPA TO-17
EPA TO-14A
EPA TO-15

Ethyl benzene

EPA TO-17

Serial No.: 59583

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All approved analytes are listed below:*

Purgeable Aromatics

Ethyl benzene	EPA TO-14A
	EPA TO-15
Isopropylbenzene	EPA TO-17
	EPA TO-15
m/p-Xylenes	EPA TO-17
	EPA TO-15
o-Xylene	EPA TO-17
	EPA TO-15
Styrene	EPA TO-17
	EPA TO-14A
	EPA TO-15
Toluene	EPA TO-17
	EPA TO-14A
	EPA TO-15
Total Xylenes	EPA TO-17
	EPA TO-14A
	EPA TO-15

Purgeable Halocarbons

1,1,1-Trichloroethane	EPA TO-17
	EPA TO-14A
	EPA TO-15
1,1,2,2-Tetrachloroethane	EPA TO-14A
	EPA TO-15
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA TO-17
	EPA TO-14A

Purgeable Halocarbons

1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA TO-15
1,1,2-Trichloroethane	EPA TO-17
	EPA TO-14A
	EPA TO-15
1,1-Dichloroethane	EPA TO-17
	EPA TO-14A
	EPA TO-15
1,1-Dichloroethene	EPA TO-17
	EPA TO-14A
	EPA TO-15
1,2-Dibromoethane	EPA TO-14A
	EPA TO-15
1,2-Dichloroethane	EPA TO-17
	EPA TO-14A
	EPA TO-15
1,2-Dichloropropane	EPA TO-17
	EPA TO-14A
	EPA TO-15
3-Chloropropene (Allyl chloride)	EPA TO-15
Bromodichloromethane	EPA TO-14A
	EPA TO-15
Bromoform	EPA TO-15
Bromomethane	EPA TO-14A
	EPA TO-15
Carbon tetrachloride	EPA TO-17
	EPA TO-14A

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Purgeable Halocarbons

Carbon tetrachloride	EPA TO-15
Chloroethane	EPA TO-14A
	EPA TO-15
Chloroform	EPA TO-17
	EPA TO-14A
	EPA TO-15
Chloromethane	EPA TO-14A
	EPA TO-15
cis-1,2-Dichloroethene	EPA TO-17
	EPA TO-14A
	EPA TO-15
cis-1,3-Dichloropropene	EPA TO-14A
	EPA TO-15
Dibromochloromethane	EPA TO-15
Dichlorodifluoromethane	EPA TO-14A
	EPA TO-15
Methylene chloride	EPA TO-17
	EPA TO-14A
	EPA TO-15
Tetrachloroethene	EPA TO-17
	EPA TO-14A
	EPA TO-15
trans-1,2-Dichloroethene	EPA TO-17
	EPA TO-14A
	EPA TO-15
trans-1,3-Dichloropropene	EPA TO-14A

Purgeable Halocarbons

trans-1,3-Dichloropropene	EPA TO-15
Trichloroethene	EPA TO-17
	EPA TO-14A
	EPA TO-15
Trichlorofluoromethane	EPA TO-17
	EPA TO-14A
	EPA TO-15
Vinyl chloride	EPA TO-17
	EPA TO-14A
	EPA TO-15

Volatile Chlorinated Organics

Benzyl chloride	EPA TO-14A
	EPA TO-15

Volatile Organics

1,2-Dichlorotetrafluoroethane	EPA TO-14A
	EPA TO-15
1,3-Butadiene	EPA TO-17
	EPA TO-14A
	EPA TO-15
1,4-Dioxane	EPA TO-17
	EPA TO-15
2,2,4-Trimethylpentane	EPA TO-17
	EPA TO-15
2-Butanone (Methylethyl ketone)	EPA TO-17
	EPA TO-15

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Volatile Organics

4-Methyl-2-Pentanone	EPA TO-15
Acetone	EPA TO-15
Carbon Disulfide	EPA TO-17
	EPA TO-15
Cyclohexane	EPA TO-15
Hexane	EPA TO-17
	EPA TO-15
Isopropanol	EPA TO-15
Methyl tert-butyl ether	EPA TO-17
	EPA TO-15
n-Heptane	EPA TO-15
Vinyl acetate	EPA TO-15

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