C.T. MALE ASSOCIATES
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January 11, 2018

Mr. John Schmeltzer ***Via Email***
State of Vermont
Department of Environmental Conservation
Water Management and Prevention Division
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704

*Re: Supplemental Site Investigation Work Plan-Draft Rev. 1*
*Former Chemfab Facility*
*1030 Water Street*
*North Bennington, Vermont*
*Site # 20164630*

Dear Mr. Schmeltzer:

This plan has been revised to address comments received from the Vermont Department of Environmental Conservation (VTDEC) in the December 12, 2017 letter referenced as "Comments on Draft Supplemental Site Investigation Work Plan, Prepared by CT Male, Former Chemfab Facility, Water Street, North Bennington, Vermont, (SMS Site #20164630)".

In accordance with the Consent Order and Final Judgment (effective date October 2, 2017), Appendix A, Section VI, Corrective Action Area II (CAA II), Item 11, a Site Investigation Work Plan for the Water Street Site (Site), as referenced above, is required to investigate the inside of the Water Street building. This plan is referred to as the "Supplemental Site Investigation Work Plan" as it is a continuation of the site investigations and relies in part on the findings of the previously approved components of the April 29, 2016 Site Characterization Investigation Work Plan (SCIWP). The majority of the approved Site investigations identified in the SCIWP have been substantially completed, and the data reported to VTDEC as summary data tables.

The planned investigations are intended to meet the requirements related to:

- The Vermont Agency of Natural Resources (ANR) Rule, "Investigation and Remediation of Contaminated Properties Rule (IROCPR)" effective July 27, 2017.

This Supplemental Work Plan defines the scope of work to be performed by C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, D.P.C. (C.T. Male) and Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain).

The purpose of this planned scope of work is to assess Site conditions not yet investigated to inform the Site Characterization Investigation, as noted above, by further characterizing the distribution of primarily poly - and perfluoroalkyl substances (PFAS) in soil, groundwater and other media within and beneath the Water Street building.

**Background**

Site investigative work and its status completed to date per the April 29, 2016 SCIWP is summarized below. Property access was unavailable between January 2017 and August 21, 2017. Accordingly, between January and August 21, 2017 the investigative work focused on activities that did not require site access. The work completed to date has included:

- Site reconnaissance to gain a general understanding of the Site setting and layout (completed).
- A review of the 2001 Phase I Environmental Site Assessment and the VTDEC Spills and bulk storage database for the Site (completed).
- A review of currently available drawings of the Site and facility (completed).
    - Additional Site maps, plans and figures, if any, made available will be reviewed throughout the investigation.
- A review of water supply well analytical data for PFAS as collected by the VTDEC (completed).
- Collection and analysis of shallow soils (zero to two feet below grade) for PFAS from within the Site and properties surrounding the Site (completed).
- Reconnaissance of the interior portions of the Site building to identify areas and conditions of potential environmental concern (completed).
- A review of published geologic, hydrogeologic and soil mapping data to generally establish the geologic setting of the Site and surrounding area (completed).
- An evaluation of well construction details gathered by the VTDEC for the water supply wells sampled by VTDEC for PFAS (partially completed).
- An evaluation of the former plant interior, including: locations of floor drains, pits, sumps and other potential liquid coating transport routes on or below the

former plant production floor (the subject of this Supplemental Work Plan).

Based on the preliminary findings from investigation activities throughout the Bennington area, a draft Conceptual Site Model (June 2017 Draft CSM) was developed. Chemical characteristics in groundwater and soil of PFAS were examined, primarily as they relate to perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), and modeling studies relating to PFAS fate and transport were performed.

Site related investigations undertaken by Saint-Gobain and VTDEC to date have provided analytical data in the following media for PFAS, and in part for Target Compound List (TCL) volatile and semi-volatile organic compounds (VOCs and SVOCs), pesticides and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, cyanide and mercury, Total Organic Carbon (TOC) and major cations (Ca, Mg, Na and K)/anions (Cl, $SO_4$, $CO_3$ and $HCO_3$).

- Soil and groundwater within the former Chemfab property;
- Surficial and shallow subsurface soils within the former Chemfab property and nearby areas;
- Sewage sludge from the Town of Bennington Waste Water Treatment Plant;
- Sanitary sewer line sediments from the one of two sanitary sewer lines exiting the Site building;
- Sewage flow within the municipal sanitary sewers both upstream and downstream of the former Chemfab property; and
- Surface water, sediment and fish tissue from Paran Creek and Walloomsac River.

The analytical results for surface and subsurface soils, and groundwater, sampled by Saint-Gobain were previously provided to VTDEC. The analytical results for the sewage line results from the facility sewer line and liquid sewage from the municipal sewer lines will be provided under separate cover, and incorporated into the Site Investigation report.

Other investigations completed prior to Site access being reestablished included:

- Boundary and topographic survey (with improvements) of the Site;
- Locating and tracing (no video) underground waste water piping (sewers and floor drains); and
- Locating and tracing interior above ground waste water piping.

**Planned Investigation Tasks**

The following investigation tasks are proposed for this supplemental scope of work:

- Video inspecting and recording the identified sewer, floor drain and storm drain piping runs;
- Collecting sediment samples from onsite sewer piping and stormwater catch basins;
- Collecting residual materials in floor drain outfall pipe to Paran Creek;
- Sampling soil at interior Geoprobe soil borings;
- Sampling shallow groundwater at interior Geoprobe temporary/permanent piezometers;
- Surveying the interior building layout, primarily non-office spaces including the northern basement area beneath the northernmost section of the building;
- Collecting wipe samples for PFAS from the interior wall, support columns, other non-porous building materials, and remaining process stacks and ductwork;
- Collecting bulk samples for PFAS from the interior floor, ceiling and wall insulation, sheetrock, and/or other building materials;
- Further review of historical manufacturing operations at the Site to the extent information, if any, is readily available;
- Visually inspecting the roof deck for evidence of and sampling for residual wastes potentially related to historical manufacturing activities, if applicable;
- Continue performing quarterly monitoring and sampling of Site monitoring wells (including newly installed temporary/permanent interior piezometers); and
- Supporting the development of the Corrective Action Feasibility Investigation Report and ultimately the Corrective Action Plan.

The primary focus of this scope of work is to characterize the distribution of PFAS at the Site. Specific data gaps identified in the Draft CSM Report (Barr, 2017) may also be informed by these investigation results.

**Sampling Objectives**

The objectives related to the planned investigative tasks above are as follows:

**Liquid/Waste Conveyance Systems**

*Video Inspection of Waste Water, Floor Drain, and Stormwater Piping*
Identify possible breaches or misalignments of piping sections along the piping routes so planned interior Geoprobe locations can be adjusted and/or added to assess these locations.

*Storm Water Catch Basin Sediments*
Determine if sediments are present within the two onsite catch basins and if the sediments are environmentally impacted by former Site operations.

*Sewer Line and Floor Drain Sampling*
Determine if accumulated sediments are present within the floor drain and waste water lines and if the sediments are environmentally impacted by former Site operations.

**Interior Geoprobe Soil Borings and Monitoring Wells**

Evaluate soil and groundwater quality relative to the identified chemical parameters and determine the presence and concentrations, if any, beneath the Site building.

**Visual Inspection of Building Roof Deck**

Assess if residual materials exist on the roof deck. If present, sampling of residual materials will be completed to determine if the material contains PFAS.

**Interior Building Assessment**

Establish survey control as necessary to identify the locations of various sampling locations and building material components. The survey will focus on the building areas north of the office area in the southern portion of the building, and the Site associated basement area in the northern portion of the building footprint.

Evaluate the distribution of PFAS-impacted building materials by collecting wipe samples of various surfaces and bulk samples of building materials for PFAS analysis. Wipe samples will be collected in general conformance with USEPA 40 CFR 761.123, and as provided in the Field Sampling Plan (FSP) (Attachment 1). Bulk samples will be collected from surface residuals and ceiling insulation.

**Stack and Ductwork Assessment**

Assess if PFAS material is present on interior coating tower related stacks and ductwork assemblies. Although the majority of the interior coating tower related stacks and ductwork assemblies (upstream and downstream air treatment) are no longer present, the stacks and ductwork that remain and penetrate the roof (see Figure 2) may be accessible from the interior of the building. If interior sections of the stacks and ductwork are accessible, samples of interior surfaces in the form of either wipe samples (in general conformance with USEPA 40 CFR 761.123) or scraped bulk material will be collected for PFAS analysis from up to four locations. At least one sample (wipe or bulk) from former Tower E will be collected if the stack and ductwork are present and safely accessible from the interior.

**Total Oxidizable Precursors (TOP) Assay**

To assess if a PFAS precursor mass is present in groundwater at the Site, a subset of the existing and proposed Site monitoring wells will be sampled for TOP Assay analysis. Samples from existing monitoring wells MW-02, MW-04 and MW-07 will be collected, and from two of the six proposed interior monitoring wells. The selection of interior monitoring wells to be sampled for TOP Assay analysis will be based on the PFAS analytical results of the first suite of groundwater samples collected from these wells.

**Sampling and Analytical Methods**

A summary of the planned sampling and analyses for each investigative task is provided in Tables 1 through 3. The tasks will be performed in general accordance with the project Quality Assurance Project Plan (QAPP), FSP and Health and Safety Plan (HASP). All samples will be analyzed at Eurofins Lancaster Laboratories Environmental (ELLE) in Lancaster, Pennsylvania. Analytical methods for each media sample are summarized in Tables 1 through 3 and in the QAPP.

Water samples will be analyzed for the analytes identified for each task described below using the analytical methods identified in the QAPP, including:

- **TCL VOCs:** EPA Analytical Method SW-846 8260C for Water and Soil and EPA Preparation Methods 5030C (Water) and 5035A (Soil)
- **TCL SVOCs:** EPA Analytical Method SW-846 8270D for Water and Soil and EPA Preparation Methods 5030C (Water) and 5035A (Soil)

- **TAL metals and cations:** EPA Analytical Methods SW-846 6010C and 6020A and EPA Preparation Methods 3005A and 3020A; EPA 9012A (**cyanide**); and EPA 7471 (**mercury**)
- **Anions:** EPA Analytical and Preparation Methods SW-846 (300.0, 300.0/353.2, and SM2320 B-1997)
- **PFAS:** EPA Method 537 Rev 1.1 Modified for Water (see QAPP for list of PFAS)
- **TOP Assay:** EPA Method 537 Modified (see QAPP for list of PFAS)
- **1,4-Dioxane:** EPA Method SW-846 8270C SIM with isotope dilution

All soil samples will be field screened in accordance with the QAPP and analyzed for:

- **PFAS:** EPA Method 537 Rev 1.1 Modified for Soil (see QAPP for list of PFAS)
- **TCL VOCs:** EPA Analytical Method SW-846 8260C for Water and Soil and EPA Preparation Method 5035A (Soil)
- **TCL SVOCs:** EPA Analytical Method SW-846 8270D for Water and Soil and EPA Preparation Methods 5030C (Water) and 5035A (Soil)
- **TAL metals and cations:** EPA Analytical Methods SW-846 6010C and 6020A and EPA Preparation Methods 3005A and 3020A; EPA 7471 (**mercury**),
- **TOC:** Standard Method 5310B, modified 2000,
- **Moisture content:** Standard Method 2540G-97, and
- **pH:** EPA Method 9045D

Wipe and bulk material will be analyzed accordance with the QAPP for:

- **PFASs:** EPA Method 537 Rev 1.1 modified for wipe and bulk samples (see QAPP for list of PFAS)

**Sampling Quality Control**

*Source Materials Quality Control*

PFAS (including PFOA) are found in several everyday items. As a check for cross-contamination, quality control samples will be collected from source materials that are anticipated to be used for the investigation. These include water used by the drilling contractor for drilling and decontamination; bottled spring and distilled water used as final decontamination rinse water; casing, rods, water totes, and tanks used by the drilling contractor; filter sand used as monitoring well sand pack; and monitoring well construction materials (PVC riser and screen). The samples will be collected and analyzed for PFAS by EPA Method 537 for aqueous samples and EPA Method 537

modified for solids. The types of source materials quality control samples to be collected and the sampling method and rationale are presented in the FSP.

*Field Quality Control*

Field Quality Control samples include equipment blanks, duplicates, and matrix spike/matrix spike duplicate (MS/MSD). Quality control samples will be prepared for each media type at a ratio of one (1) set of quality control samples per each 20 media samples. Laboratory prepared trip blanks will be submitted with aqueous samples requiring analysis for TCL VOCs and PFAS. Field trip blanks will be submitted with aqueous samples requiring analysis for PFAS. The types of field quality control samples to be collected and the sampling method and rationale are detailed in the FSP.

*Laboratory Data Quality Control*

Laboratory reports will be prepared by the laboratories of record as a USEPA Category B Data Deliverable Package. These deliverables will be subject to independent data validation.

**Survey**

The boundary and topographic survey of the Site will be updated to serve as a scaled base map for the Site investigations and related investigation report maps and figures. Exploratory locations (i.e. test borings, monitoring wells, piping routes, etc.), media sampling locations and other pertinent surface features will be surveyed. The top of the well casings will be referenced to the NAVD88 vertical datum.

**Supplemental Plans**

The April 24, 2016 SCIWP FSP, QAPP, and HASP documents have been updated and will be followed during the planned investigations described herein. Copies of the updated plans are included as Attachments 1 through 3, respectively.

*Field Sampling Plan*

The field activities for this project will include collection and laboratory analysis of soil/fill, groundwater, surface wipe and bulk building materials. The procedures relative to implementation of these field activities are presented in the FSP (Attachment 1). The FSP describes in detail the various methods and techniques to be followed during the completion of the soil and groundwater sampling activities, instrument

operation and calibration, and chain of custody procedures.

*Quality Assurance Project Plan*

The QAPP (Attachment 2) describes the quality assurance and quality control procedures to be followed from the time media samples are collected to the time they are analyzed by the environmental analytical laboratory and evaluated by a third party data validator.

The QAPP will be followed by field personnel during the initial Site characterization investigation activities and media sampling events. It will also be used by the project management team and Quality Assurance Officer to assure the data collected and generated is representative and accurate. The laboratory results will be reported with EPA Analytical Services Protocols (ASP) Category B deliverables.

*Health and Safety Plan*

The HASP (Attachment 3) has been updated to address Site worker health and safety issues. The HASP is presented as a standalone document that will be used by field personnel. Although the plan addresses all of the planned Site activities, subcontractors will be required to develop their own HASP for work they will perform.

**Report**

A Site Investigation (SI) Report will be prepared following the completion of the supplemental site investigations provided herein, inclusive of the findings and results of the Site investigative activities completed prior to the execution of the Consent Order and Final Judgment in October 2017. The SI report will be prepared in accordance with Subchapter 3, Section 35-305 of Vermont ANR Rule, "Investigation and Remediation of Contaminated Properties Rule (IROCPR)" effective July 27 2017, and inclusive of the deliverables indentified in the I-Rule Site Investigation Report Checklist and photographic documentation of the various sampling locations. An updated CSM will be detailed in the SI Report that incorporates the data collected from each media at the facility, including the relevant data previously presented to VTDEC under separate cover.

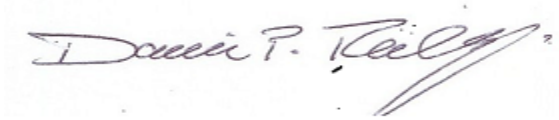
**Schedule**

A project schedule will be developed and provided for review following receipt of comments from VTDEC per the Consent Order.

If you have any questions or comments regarding this plan, please contact the undersigned at your convenience.

Respectfully submitted,
C.T. MALE ASSOCIATES, D.P.C.

Kirk Moline, P.G.
Managing Geologist



Daniel Reilly, P.E.
Manager, Environmental Services Division

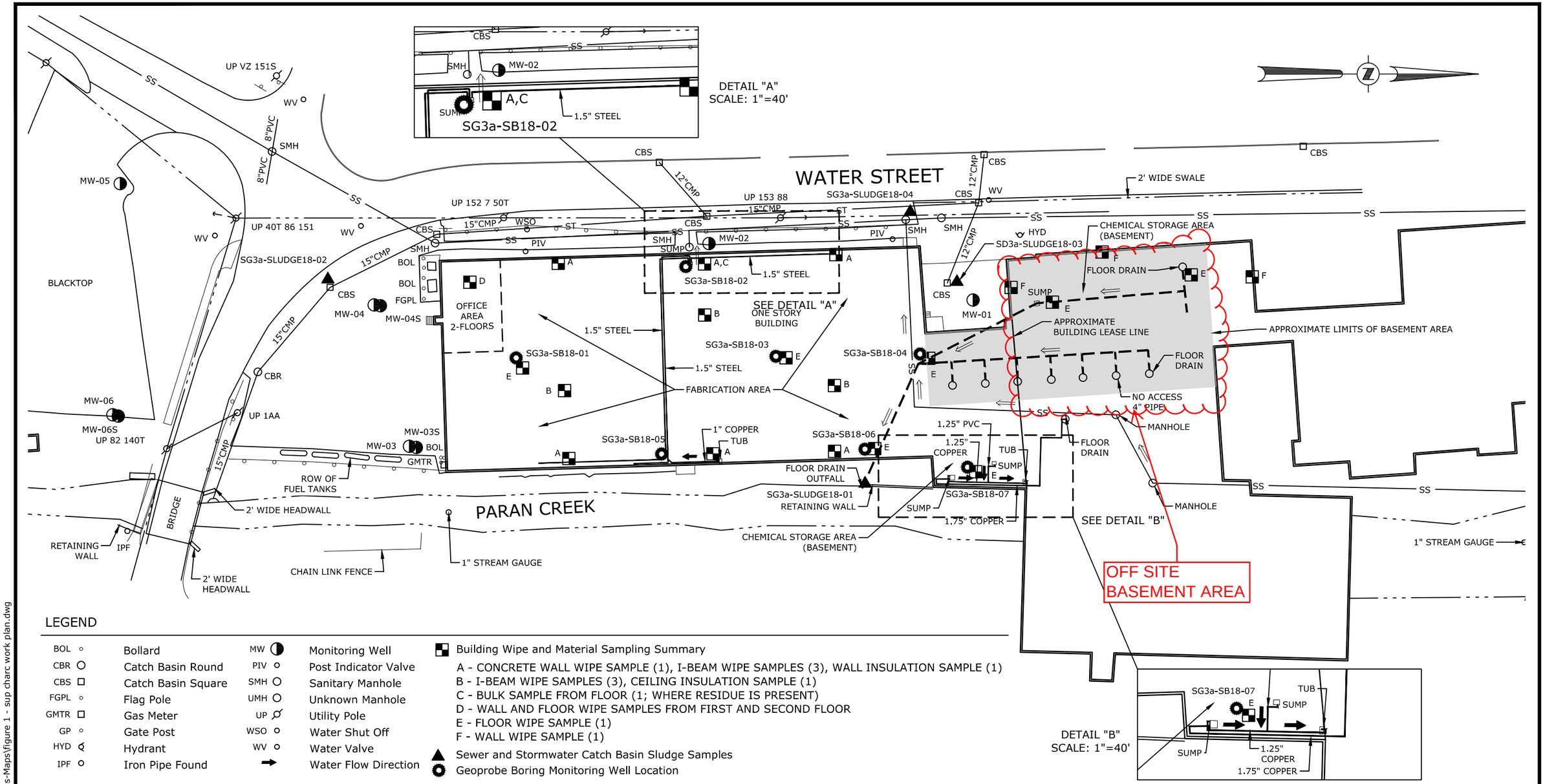
| | | |
|---|---|---|
| Attachments: | Figure 1: | Supplemental Site Investigation Work Plan |
| | Figure 2: | Aerial Photo of Facility Roof |
| | Table1: | Soil & Sludge/Sediment Sampling |
| | Table 2: | Groundwater Sampling |
| | Table 3: | Building Material Wipe + Insulation Sampling |
| | Attachment 1: | Field Sampling Plan |
| | Attachment 2: | Quality Assurance Project Plan |
| | Attachment 3: | Health and Safety Plan |

C: Richard Spiese, VTDEC
Christopher Angier, P.E. Saint-Gobain
Edward Canning, Saint-Gobain
David F. Edelstein, Archer & Greiner, P.C.
Karma Hughes, P.G., Barr
Ray Wuolo, P.E. P.G., Barr
Mary Sands, Barr

# FIGURES

XREFS: NONE

PROJECT NUMBER: 16.6131




## LEGEND

| | | | |
|---|---|---|---|
| BOL | Bollard | MW | Monitoring Well |
| CBR | Catch Basin Round | PIV | Post Indicator Valve |
| CBS | Catch Basin Square | SMH | Sanitary Manhole |
| FGPL | Flag Pole | UMH | Unknown Manhole |
| GMTR | Gas Meter | UP | Utility Pole |
| GP | Gate Post | WSO | Water Shut Off |
| HYD | Hydrant | WV | Water Valve |
| IPF | Iron Pipe Found | | Water Flow Direction |

Building Wipe and Material Sampling Summary

A - CONCRETE WALL WIPE SAMPLE (1), I-BEAM WIPE SAMPLES (3), WALL INSULATION SAMPLE (1)
B - I-BEAM WIPE SAMPLES (3), CEILING INSULATION SAMPLE (1)
C - BULK SAMPLE FROM FLOOR (1; WHERE RESIDUE IS PRESENT)
D - WALL AND FLOOR WIPE SAMPLES FROM FIRST AND SECOND FLOOR
E - FLOOR WIPE SAMPLE (1)
F - WALL WIPE SAMPLE (1)

Sewer and Stormwater Catch Basin Sludge Samples

Geoprobe Boring Monitoring Well Location

**PROGRESS PRINT**

| DATE | REVISIONS RECORD/DESCRIPTION | DRAFTED | CHECK | APPR. |
|---|---|---|---|---|
| | 1 | | | |
| | 2 | | | |
| | 3 | | | |
| | 4 | | | |
| | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | | |
| | 9 | | | |



DESIGNED : J.DIPPERT
DRAFTED : S.WUNSCH
CHECKED : J.DIPPERT
PROJ. NO : 16.6131
SCALE : 1"=60'
DATE : NOV. 15, 2017

# FIGURE 1
## SUPPLEMENTAL SITE INVESTIGATION WORK PLAN

### 1030 WATER STREET

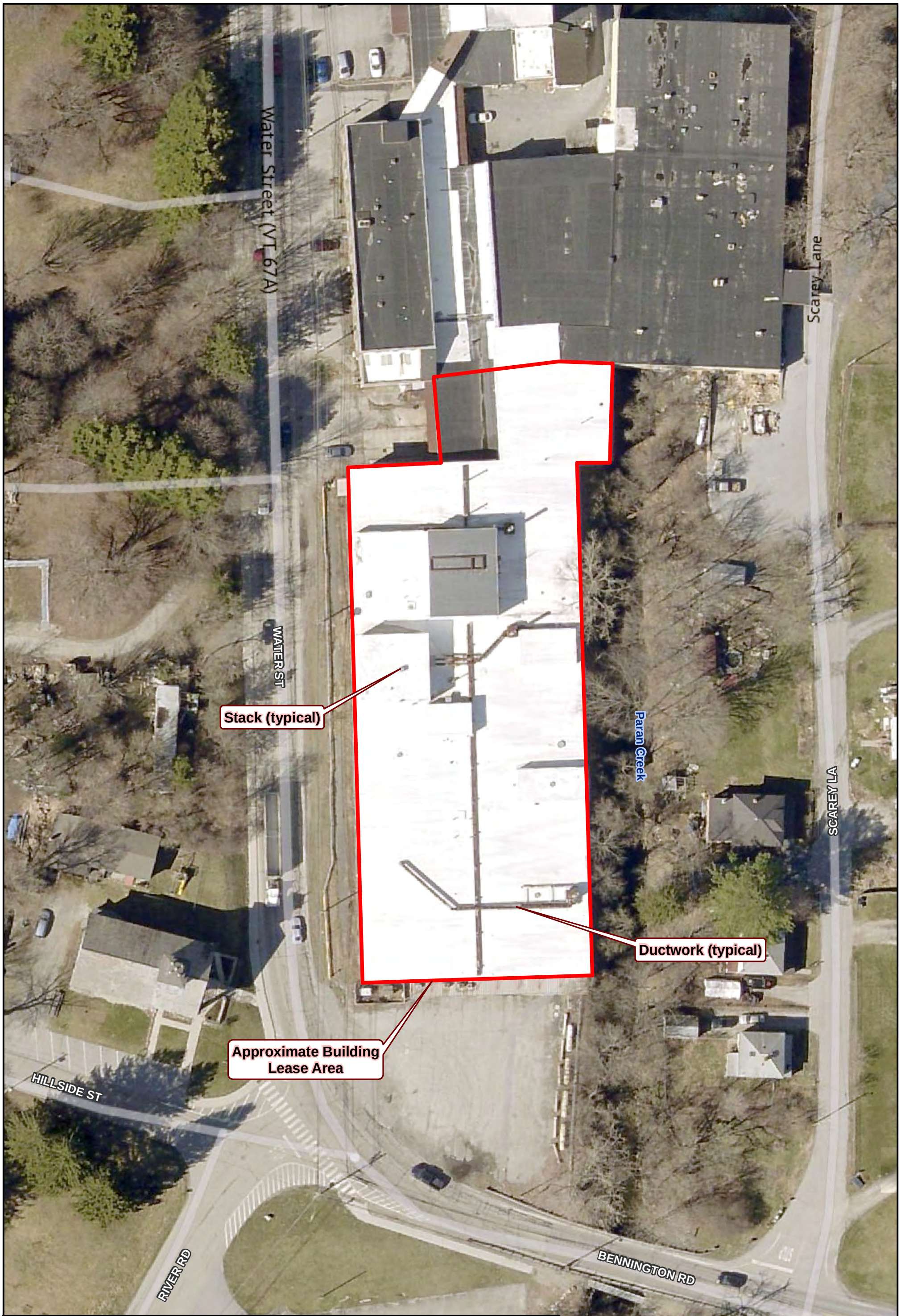
TOWN OF BENNINGTON — BENNINGTON COUNTY, VERMONT

**C.T. MALE ASSOCIATES**
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110
518.786.7400 * FAX 518.786.7299

SHEET 1 OF 1
DWG. NO: 17-XXX

CAD DWG. FILE NAME: K:\Projects\166131\Env\Drawings-Maps\figure 1 - sup charc work plan.dwg

CAD DWG. FILE NAME: figure 1 - sup charc




0 25 50 100 FT

1 inch = 50 feet

N W E S

*Project Number: 16.6131*
*Data Source: Pictometry*
*Projection: State Plane NAD83 Vermont*
*Date: January 09, 2018*
*File: 1030WaterStreetFacilityRoof11x17.mxd*
*GIS: C Secor*

**Aerial Photo taken April 14th, 2017.**

**Figure 2: Aerial Photo of Facility Roof**

**Village of North Bennington** **Bennington County, Vermont**

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FOUNDED IN 1910

# TABLES

**Table 1**
**Soil and Sludge/Sediment Sampling**
**1030 Water Street**
**Bennington, Vermont**

| Location | Location Rationale | Approximate Depth (feet bgs) | Sample Depth (feet bgs)[1] | Parameters | | | | | Number of Samples |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Metals | SVOCs | VOCs | PFCs | TOC | |
| SG3a-SB18-01 | Evaluate soil/fill quality beneath the slab in the former fabrication area. | 20 | 0-1<br>10-11<br>15-20 | | | | X | X | 3 |
| SG3a-SB18-02 | Evaluate soil/fill quality beneath the slab near a sump and former high bay structure. | 20 | 0-1<br>10-11<br>15-20 | X | X | X | X | X | 3 |
| SG3a-SB18-03 | Evaluate soil/fill quality beneath the slab in the former fabrication area. | 20 | 0-1<br>10-11<br>15-20 | | | | X | X | 3 |
| SG3a-SB18-04 | Evaluate soil/fill quality beneath the slab in the former fabrication area and near a pipe clean-out. | 20 | 0-1<br>10-11<br>15-20 | | | | X | X | 3 |
| SG3a-SB18-05 | Evaluate soil/fill quality beneath the slab near a former high bay structure. | 20 | 0-1<br>10-11<br>15-20 | | | | X | X | 3 |
| SG3a-SB18-06 | Evaluate soil/fill quality beneath the slab near a former high bay structure. | 20 | 0-1<br>10-11<br>15-20 | | | | X | X | 3 |
| SG3a-SB18-07 | Evaluate soil/fill quality beneath the slab near a sump. | 20 | 0-1<br>10-11<br>15-20 | X | X | X | X | X | 3 |
| SG3a-SLUDGE18-01 | Evaluate sludge conditions inside the floor drain discharge pipe. | NA | NA | X | X | X | X | X | 1 |
| SG3a-SLUDGE18-02 | Evaluate sediment in stormwater catch basin. | NA | NA | X | X | X | X | X | 1 |
| SG3a-SLUDGE18-03 | Evaluate sediment in stormwater catch basin. | NA | NA | X | X | X | X | X | 1 |
| SG3a-SLUDGE18-04 | Evaluate sediment in sanitary sewer manhole. | NA | NA | X | X | X | X | X | 1 |

**Notes:**
NA - Not applicable
bgs - below ground surface

1 - assumes soil samples will be collected below the building slab, at the approximate depth of groundwater (10-11 feet bgs), and approximately 5 feet below the groundwater table (15-16 feet bgs). Additional samples will be collected near lithologic contacts if that geologic unit is not sampled as part of the prescribed intervals.

**Table 2**
**Groundwater Sampling**
**1030 Water Street**
**Bennington, Vermont**

| Location | Location Rationale | Approximate Total Depth (feet bgs) | Estimated Depth to Water (feet bgs) | Estimated Screened Interval (feet bgs) | Parameters | | | | | Number of Samples* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Metals | SVOCs | VOCs | PFCs | TOP | |
| SG3a-SB18-01 | Evaluate groundwater conditions below the former fabrication area slab. | 20 | 10 | 10-20 | X | X | X | x | TBD | 1 |
| SG3a-SB18-02 | Evaluate groundwater conditions below a sump in the former fabrication area. | 20 | 10 | 10-20 | X | X | X | X | TBD | 1 |
| SG3a-SB18-03 | Evaluate groundwater conditions below the former fabrication area slab. | 20 | 10 | 10-20 | X | X | X | X | TBD | 1 |
| SG3a-SB18-04 | Evaluate groundwater conditions below the former fabrication area slab. | 20 | 10 | 10-20 | X | X | X | X | TBD | 1 |
| SG3a-SB18-05 | Evaluate groundwater conditions below the former fabrication area slab. | 20 | 10 | 10-20 | X | X | X | X | TBD | 1 |
| SG3a-SB18-06 | Evaluate groundwater conditions below the former fabrication area slab. | 20 | 10 | 10-20 | X | X | X | X | TBD | 1 |
| SG3a-SB18-07 | Evaluate groundwater conditions below a sump in the former fabrication area. | 20 | 10 | 10-20 | X | X | X | X | TBD | 1 |

**Notes:**
bgs - below ground surface, TBD - To Be Determined per the Work Plan
* In addition to the listed samples, groundwater samples will also be collected from the exisiting site monitoring wells (MW-01 through MW-07) for all parameters.

**Table 3**
**Building Material Wipe + Insulation Sampling**
**1030 Water Street**
**Bennington, Vermont**

| Sample ID | Location Rationale | Sample[1] | | Number of Samples |
|---|---|---|---|---|
| | | Wipe[2] | Bulk | |
| **Former Chemfab Building - Fabrication Area** | | | | |
| SG3a-Beam-WIPE18-01 to SG3a-Beam-WIPE18-09 | Evaluate for the presence of PFCs on an I-beam in the former fabrication area. Samples will be collected near the floor, near the ceiling, and in the middle of the I-beam. | X | | 27 |
| SG3a-Wall-WIPE18-01 to SG3a-Wall-WIPE18-03 | Evaluate for the presence of PFCs on the concrete wall along the perimeter of the former fabrication area. | X | | 3 |
| SG3a-Floor-WIPE18-01 to SG3a-Floor-WIPE18-05 | Evaluate for the presence of PFCs on the concrete floor in the former fabrication area. | X | | 5 |
| SG3a-Ceiling-MAT18-01 to SG3a-Ceiling-MAT18-03 | Evaluate for the presence of PFCs in ceiling insulation in the former fabrication area. | | X | 3 |
| SG3a-Floor-MAT18-01 to SG3a-Floor-MAT18-05 | Evaluate for the presence of PFCs in the residue on the concrete floor in the former fabrication area. | | X | 5 |
| **Former Chemfab Building - Office** | | | | |
| SG3a-Wall-WIPE18-04 to SG3a-Wall-WIPE18-05 | Evaluate for the presence of PFCs on the concrete wall along the perimeter of the former office. | X | | 2 |
| SG3a-Floor-WIPE18-06 to SG3a-Floor-WIPE18-07 | Evaluate for the presence of PFCs on the concrete floor in the former office. | X | | 2 |
| **Former Chemfab Building - Chemical Storage** | | | | |
| SG3a-Wall-WIPE18-06 to SG3a-Wall-WIPE18-08 | Evaluate for the presence of PFCs on the concrete wall along the perimeter of the former chemical storage area. | X | | 3 |
| SG3a-Floor-WIPE18-08 to SG3a-Floor-WIPE18-09 | Evaluate for the presence of PFCs on the concrete floor in the former chemical storage area. | X | | 2 |
| **Former Chemfab Building - Roof** | | | | |
| SG3a- Roof Residue/ WIPE18-0X to 0X | Evaluate for the presence of PFCs on the roof of the facility. | X | X | TBD |
| **Former Chemfab Building - Stacks & Ductwork** | | | | |
| SG3a- Stack-Duct Residue/ WIPE18-0X to 0X | Evaluate for the presence of residue within fromer coating tower stacks and ductwork. | X | X | TBD |

Notes: 1 - samples analyzed for PFCs; 2 - wipe sample results will be weight of PFCs, not a concentration and used to confirm presence or absence of PFCs

# ATTACHMENT 1

# FIELD SAMPLING PLAN

January 2018

# Field Sampling Plan

## Saint Gobain
## Performance Plastics
## Village of North Bennington &
## Town of Bennington
## Vermont

Mr. Christopher Angier
SAINT-GOBAIN PERFORMANCE PLASTICS
14 McCaffrey Street
Hoosick Falls, New York 12090

*Prepared by:*

C.T. MALE ASSOCIATES
And
BARR ENGINEERING CO.

*C.T. Male Project No: 16.6131*

**FIELD SAMPLING PLAN**
**SAINT GOBAIN PERFORMANCE PLASTICS, VERMONT**

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## 1.0 INTRODUCTION

The "Site" for the purposes of this Field Sampling Plan (FSP) encompasses the Village of North Bennington, the Town of Bennington, and surrounding areas of Bennington County, Vermont. This FSP is a supplement to various Site-specific plan(s) required under the Consent Order and Final Judgment (Consent Order), effective date of October 2, 2017. The FSP presents the standard field sampling and data gathering procedures to be followed during implementation of the field activity portion of scope of works within the Site.

This plan addresses potential media and material sampling types, drilling methods including advancement of soil borings and installation of monitoring wells, decontamination procedures, various media sampling procedures, field screening and testing procedures, field instrumentation operating procedures, field measurements, sample handling and chain of custody procedures, and water level measurement procedures. This FSP is intended to be applicable to field sampling activities within the Site conducted by C.T. Male Associates Engineering, Surveying, Architecture, & Landscape Architecture D.P.C. (CT Male), Barr Engineering Co. (Barr) and subcontractors.

This FSP is applicable to current and future investigation work plans developed to further assess the distribution of per- and polyfluoroalkyl substances (PFAS) and other constituents on behalf of Saint-Gobain Performance Plastics (Saint-Gobain).

Other parameters that may be analyzed to evaluate the environmental quality of the Site's media include the Target Compound List (TCL) of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), including 1,4-dioxane, pesticides and polychlorinated biphenyls (PCB); the Target Analyte List (TAL) of metals, including mercury and the major cations (Ca, Mg, Na and K); cyanide (CN); total organic carbon (TOC); and anions (Cl, $SO_4$, $CO_3$ and $HCO_3$).

The sample type, laboratory analysis, sampling method and sampling rationale for the samples collected during the site investigations are summarized in the Site-specific work plans.

Included in this FSP are forms, which can be found in the Compendium of Documents that are an integral part of the Quality Assurance Project Plan (QAPP). The field sampling and data gathering procedures presented in this FSP are incorporated into the QAPP by reference. Together, the FSP and the QAPP document the laboratory quality assurance/quality control (QA/QC)procedures to be followed during analysis of samples collected in the field so that valid data of a known quality is generated.

The FSP has been prepared, in part, in general accordance with the following Vermont Department of Environmental Conservation (VTDEC) and United States Environmental Protection Agency (USEPA) guidance documents:

- Chapter 31, Investigation and Remediation of Contaminated Properties Rule, State of Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management and Prevention Division, Effective July 27, 2017.

- Environmental Data Collection and Analysis Requirements, State of Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management and Prevention Division, Effective July 12, 2017.

- Chapter 7, Hazardous Waste Management Regulations, State of Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management and Prevention Division, Effective December 16, 2016.

- Chapter 12, Groundwater Protection Rule and Strategy, State of Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management and Prevention Division, Effective December 16, 2016.

- A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001, USEPA, December 1987, revised 2005.

## 2.0 MEDIA SAMPLING AND OVERVIEW OF FIELD ACTIVITIES

### *MEDIA SAMPLING*

Based upon the Site-specific work plans, sampling may include volatile organic vapor screening, subjective media assessment, laboratory analyses, and geologic and hydrogeologic characterization of the Site. The environmental media that may be sampled includes:

- Shallow soil/fill,
- Subsurface soil,
- Groundwater,
- Surface water,
- Storm water,
- Drinking water (POETs, residential wells),
- Soil vapor and sub-slab soil vapor,
- Sediments,
- Sludge,
- Sewage,
- Investigative derived waste,
- Surface wipes, and
- Bulk materials.

### *OVERVIEW OF FIELD ACTIVITIES*

The potential field activities are summarized in this FSP and details of each activity are provided within referenced standard operating procedures (SOPs).

Field Report Forms applicable to their corresponding field activity (i.e., monitoring well construction log, water level record, etc.) are referenced in their respective SOPs and contained in the Compendium of Field Documents.

# 3.0 SITE INVESTIGATION OVERVIEW

## 3.1 General

The anticipated investigations include: collection and laboratory analysis of quality control samples of source materials and rinse blanks of equipment that will be used on the Site to conduct the investigations; collection and laboratory analysis of sewage , storm water , surface water , and sludge samples; collection and laboratory analysis of shallow and deep soil/fill samples for subjective and laboratory analysis; conversion of select test borings into monitoring wells to aid in the collection of groundwater samples for laboratory analysis; collection of groundwater samples for laboratory analysis from existing monitoring wells; collection of drinking water from point of entry treatment systems (POETs) and residential water supply wells; measurement of water levels; in-situ hydraulic conductivity testing; collection of surface wipe samples; collection of bulk material(s) samples; and investigative derived waste samples. The SOPs referenced in the preceding sections have been developed for the various investigative activities that may be performed during course of the project. Additional SOPs will be developed for other investigative tasks that are not yet known or defined, as needed.

### 3.1.1 Field Quality Control Samples

As PFAS are found in several everyday items, samples will be collected from source materials prior to use on the Site to aid in the investigation and sampling of the Site. Field Quality Control samples may include Equipment Blanks, Duplicates, Field blanks, and Matrix Spike/Matrix Spike Duplicates (MS/MSD). The types of field quality control samples to be collected and the sampling method and rationale are detailed in the QAPP. The SOP for this field activity is SOP-BARR 'Collection of Quality Control Samples, Revision 6'.

### 3.1.2 Sewage and Sludge Sampling

The SOP describes the methods for collecting sewage samples for laboratory analyses. This procedure may apply to the collection of sludge samples from water treatment systems, waste water treatment samples, interceptor pits, piping runs, and public sewer system manholes. The SOP for this field activity is SOP CT Male 'Sediment, Sludge and Sewage Sampling'.

### 3.1.3 Surface Water Sampling

The SOP describes the methods for collecting surface water samples for laboratory analyses and water quality determinations. This procedure may apply to the collection of surface water samples from regulated surface water bodies, streams, rivers, ditches, lakes, ponds, lagoons, drainage swales, and wetlands. The SOP for this field activity is SOP CT Male 'Surface Water Sampling'.

### 3.1.4 Storm Water Sampling

The SOP describes the methods for collecting storm water samples for laboratory analyses and water quality determinations. This procedure may apply to the collection of storm water samples from regulated and non-regulated outfalls in relation to a site, and drainage areas from a site or in relation to the investigation or remedial activities. The SOP for this field activity is SOP CT Male 'Storm Water Sampling'.

### 3.1.5 Sediment Sampling

The SOP outlines the methods and steps for sampling sediments. This procedure may apply to the collection of sediment samples from streams, rivers, ditches, lakes, ponds, lagoons, outlet drainage ways, drainage swales, storm water outfalls, and wetlands. The SOP for this field activity is SOP CT Male 'Sediment, Sludge, and Sewage Sampling'.

### 3.1.6 Surface Wipe Sampling

The SOP describes the methods for collecting surface wipe samples from various media that may be encountered during an investigation or remediation activities at a Site for laboratory analyses. The SOP for this field activity is SOP CT Male 'Wipe Sampling'.

### 3.1.7 Bulk Material Sampling

The SOP describes the methods for collecting bulk material samples during an investigation or remediation activities at a Site for laboratory analyses. This procedure may apply to the collection of wall insulation, sheet rock, or other building materials. The SOP for this field activity is SOP CT Male 'Bulk Material

Sampling'.

### 3.2 Observation of Drilling Operations and Monitoring Well Installations

Drilling, monitoring well installation and other associated field work involved in the investigations to be performed by subcontractors to C.T. Male and Barr will be observed by full-time, on-site, C.T. Male and/or Barr representatives. C.T. Male and/or Barr will be responsible for collecting soil/fill samples, classifying soil, field screening of soil/fill samples, recording of drilling and sampling data, recording of groundwater data, deciding on the final drilling depths and monitoring well screened intervals (with input from the project manager), recording the monitoring well construction procedures, and monitoring the decontamination procedures. The representatives will also develop and purge the monitoring wells and conduct groundwater sampling, as in accordance with SOPs.

Field reports will be prepared to document the daily activities and their conformance to the work plan. The forms to be utilized by the applicable field team personnel are found in the Compendium of Field Documents.

The project manager or designee will be kept informed of the progress of work and problems encountered during the investigations so appropriate corrective action can be implemented in consultation with Saint-Gobain and VTDEC.

### 3.3 Drilling and Sampling

There are several drilling techniques that can be utilized to aid in the collection of shallow and deep soil/fill samples and for installation of monitoring wells. These include direct-push, hollow stem auger, rotosonic, and air rotary drilling techniques. The specific drilling technique to be used for the investigation will be outlined in the Site-specific work plan. CT Male and Barr personnel will observe the drilling subcontractor and the driller subcontractor will follow their SOPs for the technique specified in the work plan.

#### 3.3.1 Soil Classification

Soils collected during drilling activities will be visually classified in the field using the Unified Soil Classification System in general accordance with ASTM D-2488,

Standard Practice for Description and Identification of Soils. The soil description may include matrix and clast descriptions, moisture content, color, appearance, odor, behavior of the material and other pertinent observations. This information will be recorded on a subsurface exploration log form along with the boring identification and elevation, date started and completed, sampling intervals, standard penetration values, length of recovered sample, and depth of first groundwater encountered. During the drilling, a photoionization detector (PID) or flame ionization detector (FID) will be used to monitor the volatile organic vapors exiting the borehole and soil cuttings, and of the recovered subsurface samples. These visual observations and field measurements will be recorded on the Subsurface Exploration Log. A blank copy of a Subsurface Exploration Log form is included in the Compendium of Field Documents.

### 3.3.2 Borehole Abandonment and Drill Cuttings

In the event a borehole is not converted into a monitoring well, the drill cuttings will be placed back into the borehole provided field-screening results indicate no evidence of impacts (subject to approval by VTDEP, as applicable). If the soil cuttings cannot be returned to the borehole, the borehole will be filled from the bottom depth of the boring to grade with a cement/bentonite grout mixture (approximately 20 to 1 ratio). If required, soil cuttings will be transferred to labeled DOT 17H approved 55-gallon open top steel drums and/or plastic lined roll-off containers and staged while waiting for proper disposal. The contents of the drums/roll-off will be subsequently characterized and profiled for off-site disposal. If field-screening indicates no evidence of impacts, soil cuttings may be thin spread on the ground in the vicinity of the boring with prior approval of VTDEC.

## 3.4 Monitoring Well Installation Overburden

The installation of monitoring wells in the overburden groundwater may be used to identify hydrogeologic characteristics, groundwater constituents, contaminants of concern, contaminant plume transport, and the hydraulic relationship between the Site and localized groundwater flow. The SOP for this field activity is SOP-06 CT Male 'Monitoring Well Installation'.

Monitoring wells to be installed within select boreholes are typically completed utilizing direct-push, roto-sonic and hollow stem auger drilling methods. For the direct-push boreholes, typically one (1)-inch diameter monitoring wells with slotted screens are installed in the open boreholes. For roto-sonic and hollow stem auger boreholes, typically two (2)-inch diameter monitoring wells with slotted screens are installed within the drill casing in accordance with standard practices. Monitoring well depths, and screen lengths and depths will be calculated by the environmental scientist/geologist by maintaining accurate measurements of screen and casing placed in the borehole. Monitoring Well Construction Log forms for the monitoring wells will be completed that documents the well materials and depths.

### 3.5 Monitoring Well Installation - Bedrock

The installation of monitoring wells in the bedrock may serve a dual purpose of characterizing groundwater quality in the bedrock and long-term monitoring. The SOP for this field activity is SOP-06 CT Male 'Monitoring Well Installation'.

### 3.6 Monitoring Well Development

Once installed, each monitoring well will be developed by surging and over pumping/bailing to remove accumulated fine sediment within the well and to establish a hydraulic connection with the surrounding aquifer. Wells will be developed at an appropriate time interval post-installation using surging and pumping techniques. Monitoring of temperature, conductivity, pH, and turbidity for stabilization and appropriate values will be conducted at a minimum. The SOP for this field activity is SOP-BARR 'Monitoring Well Development', Revision 5.

### 3.7 Decontamination of Drilling and Sampling/Gauging Equipment

Drilling equipment including augers, casing, rods, plugs, samplers, tools, drill unit and equipment that can come in contact with the formation will be cleaned with a high temperature/high pressure steam cleaner (with water previously analyzed to determine it is non-detect for PFAS) prior to the start of work and between each boring to prevent cross-contamination between borings. Samples of water used for decontamination will be collected and analyzed prior to being used on the Site as described in Section 6.1. The

drilling equipment will also be cleaned using the same procedure at completion of the work to prevent contaminants from leaving the Site.

The SOP is to provide procedures for field decontamination of environmental sampling equipment and personal protective equipment (PPE). Decontamination, as needed, of equipment and PPE is designed to document that sample cross-contamination, human-health exposure, and contamination transport are minimized. The SOP for this field activity is SOP-05 CT Male 'Equipment Decontamination Procedures'.

## 4.0 GROUNDWATER SAMPLING PROCEDURES

### 4.1 General

**Groundwater Sampling**

During groundwater sampling, acceptable techniques and protocol during the collection and transportation of groundwater samples is required to minimize the potential for sample variation from well to well. Quality control measures will be instituted as discussed in this document and the QAPP as a check on the procedures being utilized so that the quality of the data can be assessed. The groundwater samples will be analyzed in the laboratory by standard methods following the QA/QC procedures outlined in the QAPP.

Periodic monitoring/sampling events may be conducted and groundwater elevations monitored to determine the groundwater flow gradient and direction. The SOP for this field activity is SOP-07 CT Male 'Groundwater Sampling'.

### 4.2 Water level Measurements, Immiscible Layers, Total Well Depth in Well

Prior to sampling, static water heights will be measured using a water level indicator to determine the standing water column height. Water levels will be collected from wells that are slated for sampling prior to initiating water sampling. The water column height and depth of the well are used to calculate the well water volume. Non-vented well caps will be removed for a period of ten minutes to allow the water column to reach static conditions prior to taking the water level measurements.

The procedure is for measuring static water level, light non-aqueous phase liquid (LNAPL) level, dense non-aqueous phase liquid (DNAPL) level, and total well depth in a groundwater well. The SOP for this field activity is SOP-BARR 'Measuring Static Water Level, Immiscible Layers (DNAPL and LNAPL), and Total Well Depth in Wells, Revision 5'.

### 4.3 Well Purging Procedures

Prior to groundwater sampling, it is necessary to purge the wells. Purging of the wells allows for a fresh, representative sample to be collected from the well by removing stagnant water.

Wells will be purged by either purging or surging, or both methods, followed by well recovery, well stabilization and then sampling via pumping or bailing. Wells will then achieve stabilization through field parameter monitoring. The SOP for this field activity is SOP Barr 'Collection of groundwater samples from a temporary or permanent monitoring well'.

If required, purge water from the monitoring wells will be placed in DOT approved 55-gallon drums and/or frac tanks, labeled and stored for proper disposal until laboratory analyses results of the soil and groundwater samples indicates the proper method of treatment or disposal.

### 4.4 Well Stabilization

Well stabilization is conducted to verify the groundwater sample is representative of aquifer conditions. A well is considered 'stabilized' after the groundwater stabilization parameter measurements are within acceptable limits for three consecutive readings. The procedures for conducting well stabilization are included in SOP Barr 'Collection of groundwater samples from a temporary or permanent monitoring well', SOP-Barr 'Collection of Groundwater Samples using low-flow purging and sampling' and SOP Barr "Measuring Water Level, Immiscible Layers (DNAPL and LNAPL), and Total Well Depth in Wells'.

### 4.5 Sample Collection

Prior to sample collection, the wells will be purged, allowed to recover to at least 80% of their initial static water level, and have achieved water quality parameters stabilization. Slow recharging wells will be allowed to recover for a period of up to four hours before sampling. Recovery times and water depths will be recorded on the Groundwater Services Field Log form. The wells will be allowed to stabilize prior to sampling. The procedures for collecting samples are included in SOP Barr 'Collection of groundwater samples from a temporary or permanent monitoring well', SOP-Barr 'Collection of Groundwater Samples using low-flow purging and sampling', and SOP Barr "Measuring Water Level, Immiscible Layers (DNAPL and LNAPL), and Total Well Depth in Wells'.

### 4.6 Low flow sampling

Low flow sampling is a method of collecting samples from a well that does not require purging volumes of water from the well and relies on natural flow of formation water through the well. Using this method, the water flowing into and through the well is representative of the groundwater with the formation surrounding the screen and this representative groundwater samples can be obtained by slowly pumping.

Low-flow sampling methods emphasize minimal stress to the groundwater by low water-level drawdown and low pumping rates in order to collect samples with minimal alterations to water chemistry (U.S. Environmental Protection Agency [EPA], 2002; ASTM D6771-02). Low-flow sampling is typically conducted using positive displacement pumps, submersible pumps, or peristaltic pumps. Commonly used low-flow pumps include the QED Sample Pro® bladder pump, Geotech® bladder pumps, Grundfos Redi-Flo 2® submersible pump, and the Geotech Geopump™ Series II peristaltic pump. The use of low flow sampling and the type of pump to be used will be specified in the site specific work plan. Pumps that are to be used onsite will be reviewed prior to use to determine if there would be an adverse impact to the sampling. The SOP for this field activity is SOP-BARR 'Low-Flow Sampling'.

### 4.7 Field Analyses

The field analyses of groundwater include pH, temperature, specific conductivity, turbidity and oxidation-reduction potential (ORP). The field analyses will be measured immediately upon collection of the sample since the values of these parameters can change with time. A minimum 40 ml sample will be collected and placed in clean unpreserved polyethylene or glass containers for analysis. The containers will be covered if the measurements are not recorded immediately.

The pH, temperature, ORP and conductivity of a sample are measured with a portable unit capable of measuring all four (4) parameters concurrently and will be completed in accordance with SOP-07 CT Male 'Groundwater Sampling'. The portable unit automatically adjusts to compensate for the temperature of the sample. The turbidity of a sample is measured with a separate portable unit. The pH, temperature, conductivity, turbidity and ORP will be recorded on the Groundwater Services Field Log. These units will be calibrated to known standards prior to the start of field activities every day. Measurement and operating procedures for these field analyses are presented in Section 7.0 of this FSP.

### 4.8 Drinking Water samples from private wells or public water supply

The collection of drinking water samples from residential or private wells with or without point-of entry-treatment (POET) systems, or public water supply systems will entail specific procedures to be completed for these types of wells. The SOP for this field activity is SOP-BARR 'Drinking Water Samples from Private Wells or Public Water Supplies, Revision 0', and SOP CT Male 'Point of Entry Treatment (POET) sampling'.

## 5.0 SOIL SAMPLING PROCEDURES

### 5.1 Shallow and Deep Soil/Fill Sampling

During site investigations there may be the sampling of shallow and deep soil/fill material. The samples may be collected employing a hand auger, Shelby tubes, direct-push sampling unit (i.e., Geoprobe®) with split barrel, and use of drilling methods such as Rotosonic, hollow stem auger, air rotary, with the use of split barrel samplers. The collected soils will be logged in accordance with ASTM D2488 (visual-manual method)

and screened for signs of obvious environmental impacts (*e.g.*, staining, sheen, odor, discoloration, or the presence of headspace as measured by a PID). The shallow and deep soil/fill samples collected from the Site will follow the sampling plan specified in the Work Plan. The SOP for this field activity is SOP-04 CT Male 'Surface and Subsurface Soil Sampling'.

### 5.2 Analytical Soil Sampling

The soil samples will be subjected to laboratory analysis to assist in characterizing the environmental quality of the Site. The samples will be extracted from the sampling equipment in a timely fashion such that the sample has limited exposure to the outside air reducing the chance for volatilization. The laboratory analytical method, container type, sample holding times, and preservation of the sample are outlined in the QAPP and the site-specific work plan. The SOPs for this field activity are contained in SOP-BARR 'Collection of Quality Control Samples, revision 6'; SOP-BARR 'Documentation of Chain of Custody, revision 4'; SOP-BARR 'Domestic Transport of Samples to Laboratories in USA, Revision 2'.

## 6.0 FIELD QUALITY CONTROL

### 6.1 Source Materials

Because PFAS (including perfluorooctanoic acid [PFOA] and perfluorooctanesulfonic acid [PFOS]) are found in many everyday items, samples will be collected of source materials prior to being used on the Site to aid in the investigation and sampling of the Site. These may include water used by the drilling contractor for advancement of test borings; construction of monitoring wells and decontamination of drilling and sampling equipment; water used by the sampling technician to decontaminate sampling equipment; totes and tanks used by the drilling contractor for temporary storage of drilling water; drill rig augers, casing and rods used by the drilling contractor for advancement of test borings; monitoring well construction materials (PVC riser and screen) used by the drilling contractor for construction of the monitoring wells; and filter sand used by the drilling contractor for the monitoring well sand pack. As a note, water imported onto the Site for investigation/sampling purposes will be identified by its source.

Field Quality Control samples may include Equipment Blanks, Duplicates, Field blanks, and Matrix Spike/Matrix Spike Duplicates (MS/MSD). The types of field quality control samples to be collected and the sampling method and rationale are summarized in the QAPP. The SOP for this field activity is SOP-BARR 'Collection of Quality Control Samples, revision 6'.

## 7.0 FIELD INSTRUMENTATION OPERATING PROCEDURES

### 7.1 General

The field instruments that may be utilized during implementation of the Site investigations or remedial activities are: PID or FID for air monitoring of the total VOCs, PID or FID for headspace analysis of soil samples for total VOCs; vapor monitoring on site; airborne particulates during field activities; a temperature/pH/ORP/conductivity meter; and a turbidity meter for field analysis of groundwater samples. The field instruments used will be calibrated and operated in accordance with the manufacturer's instructions and the procedures identified in the SOP. The SOP for this field activity is SOP-CT Male 'Field Water Quality Measurements and Calibration' and SOP-CT Male 'Organic Vapor Monitoring and Air Monitoring'.

### 7.2 Photoionization and Flame Ionization Detector

A PID and data logger with a 10.6 eV lamp will be utilized to measure total VOCs. If the ionization potential of the compound is expected to be greater than 11.7 eV a FID meter is preferred. Instruments are calibrated at the factory upon purchase and annually thereafter using certified service shops who utilize standards of benzene and isobutylene. Prior to use in the field, the instrument will be calibrated in accordance with the manufacturer's instructions using a disposable cylinder containing isobutylene obtained from a reputable supplier. The calibration value varies by the manufacturer, however, 100 parts per million is commonly utilized. During use the PID or FID will be calibrated at least once every 8 hours. The calibration procedure is contained in the PID and FID User's Manual.

Care will be taken when handling and using the PID or FID to prevent any debris from entering the sample line which will affect the instrument's operation. If this occurs, the field personnel will clean the unit or replace it with a functional PID or FID.

### 7.3 Air Monitoring for Potential Contaminant Exposure

Air monitoring for potential exposure to airborne contaminants is typically conducted using a PID, FID, CGI ( measuring oxygen level and explosive atmosphere), MultiRae Plus meter (measuring oxygen level, explosive atmosphere, PID, and hydrogen sulfide), or dust/aerosol meter. The SOP for this field activity is SOP-CT Male 'Male 'Organic Vapor Monitoring and Air Monitoring'.

### 7.4 Temperature, pH, ORP and Specific Conductivity Meter

#### 7.4.1 General

This instrument used to measure temperature, pH, ORP and specific conductivity will be equipped with an automatic temperature control for accurate adjustment to the temperatures of the samples and calibration standards. Prior to collecting the pH, ORP, and/or specific conductivity readings, the instrument will be calibrated prior to use each day. The SOP for this field activity is SOP-CT Male 'Field Water Quality Measurements and Calibration'.

## 8.0 SAMPLE HANDLING AND CHAIN OF CUSTODY PROCEDURES

The purpose of this procedure is to describe how to properly handle the sampling container and to document information on a Chain-of-Custody (COC) form. A COC is a legally binding document that includes sample identification and analyses required, and documents possession of samples from the time they are obtained until they are arrive at the laboratory. The SOPs for these field activities are SOP-BARR 'Documentation of a Chain-of-Custody, Revision 4'; SOP-BARR 'Collection of Quality Control Samples, revision 6' and SOP-BARR 'Domestic Transport of Samples to Laboratories in USA, Revision 2'.

## 9.0 WATER LEVEL MEASUREMENT PROCEDURES

Water levels will be measured in the monitoring wells using a water level indicator probe. The water levels will be measured from the surveyed reference point to the nearest 0.01 foot. Water levels will be measured progressively attempting to measure water levels from the well with the lowest concentration of target compounds to the well with the highest concentration of target compounds.

To avoid possible cross contamination of the wells, the water level indicator will be decontaminated prior to and following the water measurement of individual wells. The water level indicator will be decontaminated by rinsing it with imported water, vigorously scrubbing with a brush and laboratory-grade standard detergent (e.g., Alconox® or Liquinox®) and imported water, then rinsing it in accordance with SOP-5 'CT Male Equipment Decontamination Procedures'.

The procedure for measuring static water level and total well depth in a groundwater well is contained in SOP-BARR 'Measuring Static Water Level, Immiscible Layers (DNAPL and LNAPL), and Total Well Depth in Wells, Revision 5'.

## 10.0 POET SAMPLING

The POET systems are typically installed to treat PFAS-containing water entering a building from the current water supply source. The POET provides treated water to water fixtures (sinks, baths/showers, toilets, ice makers, outside hose connections, etc.) of the structure. The procedure for sampling, a POET system is contained in SOP CT Male 'POET Sampling'

## 11.0 SOIL VAPOR AND SUB-SLAB SAMPLING

The SOP describes the methodology for installing soil gas and sub-slab gas probes and collecting soil gas and sub-slab gas samples for laboratory analysis by using a SUMMA canister. The SOP for this field activity is SOP CT Male 'Soil Vapor Sampling'.

## 12.0 INVESTIGATION-DERIVED WASTE, STORAGE, SAMPLING AND DISPOSAL

Investigation-derived waste (IDW) will be containerized in appropriately sized compatible containers, properly stored, analytically profiled and transported to a disposal facility permitted to accept the waste. The SOP for this field activity is SOP-BARR 'Sampling and Disposal of Investigative Derived Waste, Revision 5'.

# ATTACHMENT 2

# QAPP

# Quality Assurance Project Plan
# Saint-Gobain Performance Plastics Site
# Town of Bennington
# and Village of North Bennington
# Bennington County, Vermont

Prepared for:

Saint-Gobain Performance Plastics

Prepared By:

C.T. Male Associates
Latham, New York

Barr Engineering Co.
Minneapolis, Minnesota

Revision 1
January 2018

# Table of Contents

# Acronym List

ARARs – Applicable or relevant and appropriate requirements

COC – Chain-of-custody

DQO – Data quality objective

HASP – Health & Safety Plan

LCS – Laboratory control sample

MDL – Method detection limit

MS – Matrix spike

MSD – Matrix spike duplicate

PFAS – Per-and poly-fluoroalkyl substances

PFOA – Perfluorooctanoic acid

POET– Point of Entry Treatment Systems

PCB – Polychlorinated biphenyl

PARCCS– Precision, accuracy, representativeness, completeness, comparability, and sensitivity

QA – Quality assurance

QAM – Quality Assurance Manual

QAPP – Quality Assurance Project Plan

QC – Quality control

RPD – Relative percent difference

RL – Reporting limit

SVOC – Semi-volatile organic compound

SOP – Standard operating procedure

TAL – Target Analyte List

TCL – Target Compound List

TOC – Total organic carbon

TOP – Total Oxidizable Precursor

UFP – Uniform Federal Policy

USEPA – United States Environmental Protection Agency

VTDEC – Vermont Department of Environmental Conservation

VOA – Volatile organic analysis

VOC – Volatile organic compound

WWTP – Wastewater Treatment Plant

# Introduction

C.T. Male Associates (C.T. Male) and Barr Engineering Co. (Barr) have prepared this Quality Assurance Project Plan (QAPP) for investigation activities to be conducted by Saint-Gobain Performance Plastics Corporation (Saint-Gobain) in and around the Town of Bennington, the Bennington Landfill, the Village of North Bennington, and surrounding areas of Vermont (collectively, the site or investigation area). The QAPP was prepared in accordance with the United States Environmental Protection Agency (USEPA) Intergovernmental Data Quality Task Force environmental requirements as specified in the Uniform Federal Policy (UFP) QAPP guidance document Part 2A Revised (March 2012) and addresses QAPP elements described in *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5* and *EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5*.

This project-specific 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 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 and the site-Specific Health & Safety Plan (HASP).

## Site History and Background

The site is generally centered approximately on the former Chemfab facility located at 1030 Water Street in North Bennington, Vermont. The area near the former Chemfab facility has been identified by the Vermont Department of Environmental Conservation (VTDEC) as an area of interest in the investigation of perfluorooctanoic acid (PFOA) concentrations exceeding regulatory standards in groundwater. The investigation area also includes the former Chemfab facility on Northside Drive in Bennington, Vermont, and the Bennington Landfill located at 904 Houghton Lane in Bennington, Vermont.

Multiple potential sources of PFOA are within the investigation area, including the former Chemfab facilities in North Bennington (Water Street) and Bennington (Northside Drive); landfills and solid-waste disposal areas where PFOA has been confirmed in groundwater monitoring wells (e.g., Bennington Landfill, Kocher Drive Landfill); former dump sites where disposal of miscellaneous waste, including waste potentially containing per- and poly-fluoroalkyl substances (PFAS) may have occurred (e.g., on and near Bennington College property); areas in which sewage sludge from the Bennington Wastewater Treatment Plant (WWTP) was disposed (e.g., Bennington Landfill) and potentially other locations not yet identified. Additionally, there are a number of industries in the area that likely used PFOA or other PFAS in their processes. The mechanisms for PFOA release include the transport, disposal, and leaching of PFOA-containing materials, and air emissions from these industrial facilities.

To date, PFOA has been found at detectable concentrations in certain soil borings and groundwater monitoring wells at the former Water Street facility, Bennington Landfill, and in soil and groundwater at certain locations in North Bennington and the Town of Bennington.

# QAPP Worksheet #1 & 2 – Title and Approval Page

1. **Project Identifying Information**
    a. **Site name/project name:** Saint-Gobain Performance Plastics Site
    b. **Site location/number:** Bennington, Vermont /SG3 or 45021004
2. **Lead Organization**
    a. **Lead Organization:** Saint-Gobain Performance Plastics
        i. **Project Manager (name/title/signature/date):**

Christopher S Angier 1/10/18
Christopher Angier / Senior Environmental Engineer Date

3. **State Regulatory Agency:** Vermont Department of Environmental Conservation (VTDEC)
        i. **Project Manager (name/title/signature/date):**

John Schmeltzer, Environmental Analyst / Project Manager - VTDEC Date

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

Richard Spiese, Environmental Analyst / Project Manager - VTDEC Date

4. **Other Stakeholders (as needed)**
    a. **Consulting Engineers:** C.T. Male Associates
        i. **Project Principal (name/title/signature/date):**

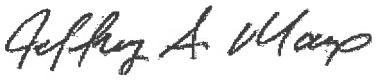
Daniel P. Reilly 01/05/18
Daniel Reilly, P.E. / Environmental Services Manager Date

**ii. Project Manager and Health & Safety Manager (name/title/signature/date):**

01/05/18

Kirk Moline / Project Manager Date

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

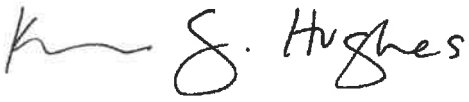


01/05/18

Jeffrey Marx, P.E. / Sr. Environmental Engineer Date

**b. Consulting Engineers:** Barr Engineering Co.

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



01/03/18

Karma Hughes, PG (MN), Senior Geologist Date

**ii. Project Manager and Health & Safety Manager (name/title/signature/date):**

01/03/18

Jonathon Carter PG (MN)/ Project Manager Date

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

01/03/18

Michael Dupay, Sr. Environmental Scientist Date

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

Investigations have been completed by C.T. Male and Barr as part of the initial site characterization:

a. *Initial Site Characterization Investigation Work Plan, Saint-Gobain Performance Plastics Site, 1030 Water Street, Village of North Bennington, Bennington County, Vermont*, prepared by C.T. Male, dated March 31, 2016 (Revised April 29, 2016)

b. *Draft Shallow Soil Sampling Report Former Chem Fab Site & Surrounding Areas, 1030 Water Street, Village of North Bennington, Bennington County, Vermont*, prepared by C.T. Male, dated July 20, 2016

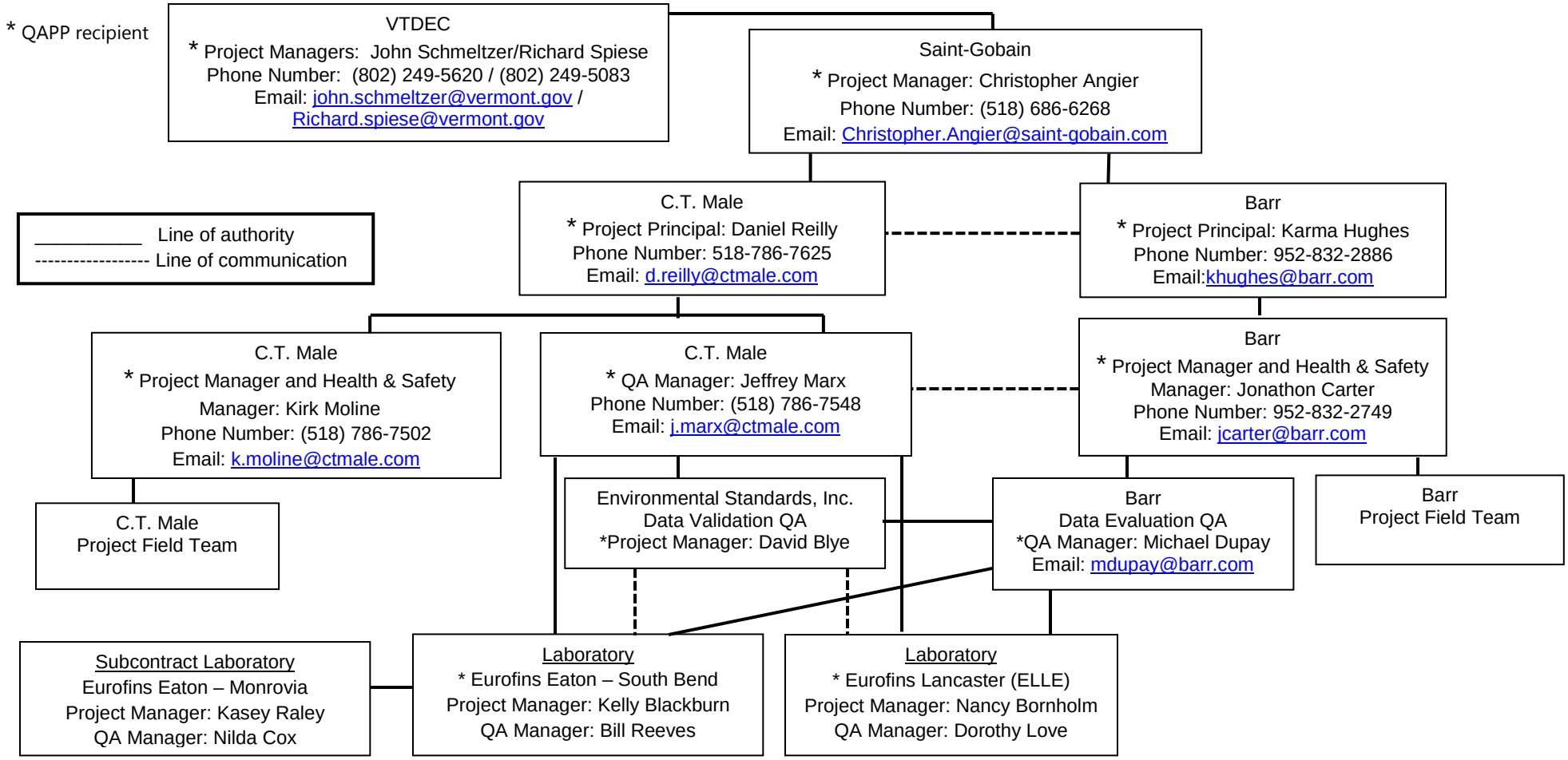
c. *Operation & Maintenance Manual, Point of Entry Treatment Systems (POET), Private Water Supply Systems, North Bennington, Bennington County, Vermont*, prepared by C.T. Male, dated February 24, 2017

d. *Water Supply Well Re-Sampling Plan, Village of North Bennington, VT, Town of Bennington, VT,* prepared by C.T. Male, dated March 6, 2016 (Revised April 5, 2017)

e. *Revised Work Plan, CSM Site Investigation: Bennington, Vermont,* prepared by Barr, dated August 2017

# QAPP Worksheet #3 & 5 – Project Organizational 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.



# 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. | 01/05/18 |
| Kirk Moline | Project Manager, Health & Safety Manager | See resumé included in Attachment A. | See resumé included in Attachment A. | 01/05/18 |
| Jeffrey Marx | QA Manager | See resumé included in Attachment A. | See resumé included in Attachment A. | 01/05/18 |

ORGANIZATION: Barr Engineering Co. (Barr)

| Name | Title/Role | Education/Experience | Specialized Training/ Certifications | Signature/Date |
|---|---|---|---|---|
| Karma Hughes | Project Principal | See resumé included in Attachment A. | See resumé included in Attachment A. | 01/03/18 |
| Jonathon Carter | Project Manager, Health & Safety Manager | See resumé included in Attachment A. | See resumé included in Attachment A. | 01/03/18 |
| Michael Dupay | QA Manager | See resumé included in Attachment A. | See resumé included in Attachment A. | 01/03/18 |

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

| Name | Title/Role | Specialized Training/ Certifications | Signature/Date | |
|---|---|---|---|---|
| Nancy Bornholm | Project Manager | Training as required by laboratory QA Manual | Nancy Jean Bornhold | 01/08/18 |
| Dorothy Love | QA Manager | Training as required by laboratory QA Manual | Dorothy M Love Digitally signed by Dorothy M. Love DN: cn=Dorothy M. Love, o=Eurofins Environment Testing US, ou=Eurofins Environment Testing US, email=dorothylove@eurofinsus.com, c=U Date: 2018.01.05 13:54:14 -05'00' | 01/08/18 |

ORGANIZATION: Eurofins Eaton Analytical, Inc. of South Bend, Indiana (Eaton IN)

| Name | Title/Role | Specialized Training/ Certifications | Signature/Date | |
|---|---|---|---|---|
| Kelly Blackburn | Project Manager | Training as required by laboratory QA Manual | Kelly Blackburn ASM | 01/08/18 |
| Bill Reeves | QA Manager | Training as required by laboratory QA Manual | Bill Reeves | 01/08/18 |

ORGANIZATION: Eurofins Eaton Analytical, Inc. of Monrovia, California (Eaton CA) (subcontracted through Eaton IN)

| Name | Title/Role | Specialized Training/ Certifications | Signature/Date | |
|---|---|---|---|---|
| Kasey Raley | Project Manager | Training as required by laboratory QA Manual | Kasey Raley | 01/10/18 |
| Nilda Cox | QA Manager | Training as required by laboratory QA Manual | Nilda B. Cox | 01/09/18 |

# 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 | VTDEC | John Schmeltzer | Office (O): 802-249-5620<br>john.schmeltzer@vermont.gov | C.T. Male or Barr will contact Saint-Gobain and the regulatory agency (VTDEC) 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. |
| | | Richard Spiese | O: 802-249-5083<br>richard.spiese@vermont.gov | |
| | C.T. Male | Kirk Moline | O: 518-786-7502<br>k.moline@ctmale.com | |
| | Barr | Jonathon Carter | O: 952-832-2749<br>jcarter@barr.com | |
| | Saint-Gobain | Christopher Angier | O: 518-686-6268<br>Christopher.Angier@saint-gobain.com | |
| Laboratory Problems / Corrective Actions | C.T. Male | Jeffrey Marx | O: 518-786-7548<br>j.marx@ctmale.com | C.T. Male or Barr 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. |
| | Barr | Michael Dupay | O: 952-832-2698<br>mdupay@barr.com | |
| | Environmental Standards | David Blye | O: 610-935-5577<br>DBlye@envstd.com | |
| | ELLE | Nancy Bornholm | O: 717-556-7250<br>NancyBorhnolm@eurofinsUS.com | |
| | Eaton IN | Kelly Blackburn | O: 574-472-5545<br>KellyBlackbrun@eurofinsUS.com | |

| Communication Driver | Organization | Name | Contact Information | Procedure (Timing, pathway, etc.) |
|---|---|---|---|---|
| Field Problems / Corrective Actions | C.T. Male | Kirk Moline | O: 518-786-7502<br>k.moline@ctmale.com | C.T. Male or Barr field staff will contact C.T. Male or Barr Project Manager, respectively, to discuss difficulties encountered during field activities. C.T. Male or Barr Project Manager will coordinate with their office's QA Manager, as needed and appropriate. |
| | Barr | Jonathon Carter | O: 952-832-2749<br>jcarter@barr.com | |
| Safety Issues | C.T. Male | Kirk Moline | O: 518-786-7502<br>k.moline@ctmale.com | C.T. Male field staff will contact the C.T. Male Project Manager/Health & Safety Manager and work may stop until safety issues are cleared. VTDEC may be contacted if safety issues delay obtaining/reporting of data. |
| | Barr | Jonathon Carter | O: 952-832-2749<br>j.carter@barr.com | Barr field staff will contact the Barr Project Manager/Health & Safety Manager and work may stop until safety issues are cleared. VTDEC may be contacted if safety issues delay obtaining/reporting of data. |
| Field Activity Modifications | VTDEC | John Schmeltzer | O: 802-249-5620<br>john.schmeltzer@vermont.gov | Saint-Gobain, C.T. Male, and Barr 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 VTDEC. |
| | | Richard Spiese | Office (O): 802-249-5083<br>richard.spiese@vermont.gov | |
| | C.T. Male | Kirk Moline | O: 518-786-7400<br>k.moline@ctmale.com | |
| | Barr | Jonathon Carter | O: 952-832-2749<br>j.carter@barr.com | |
| | Saint-Gobain | Christopher Angier | O: 518-686-6268<br>Christopher.Angier@saint-gobain.com | |

# QAPP Worksheet #9 – Project Scoping Session Participants Sheet

As noted in the introduction, investigation activities in the vicinity of the site are ongoing and are anticipated to evolve over time as additional data is collected. The sampling and analysis activities implemented as part of additional investigations or studies will follow the protocols set forth in this QAPP. Additionally, this QAPP will be updated as needed based on the planned sampling and analysis activities.

# QAPP Worksheet #10 – Conceptual Site Model

The scope of work was developed based on the conceptual model of site conditions to date. The potential chemical parameters of concern were selected based on current site conditions and the site's history. The primary chemical of concern at the site is PFOA. PFOA has been detected in the site's soils and groundwater and in some private residential wells in and around the Town of Bennington and Village of North Bennington.

Other parameters that may be analyzed to evaluate the environmental quality of the site's media include the Target Compound List (TCL) of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs); the Target Analyte List (TAL) of metals, (including mercury and the major cations (Ca, Mg, Na and K)); cyanide (CN); total organic carbon (TOC) and anions (Cl, $SO_4$, $CO_3$ and $HCO_3$). 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.

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

Potential sampling activities are summarized below and described in more detail in the site-specific work plans.

- Collecting surface and shallow soil samples for subjective and laboratory analysis.
- Collecting POET samples for laboratory analysis.
- Advancing boreholes to collect soil samples, install temporary and permanent monitoring wells in overburden, and install bedrock monitoring wells.
- Developing the newly installed monitoring wells, and purging and collecting groundwater samples for laboratory analysis from overburden and bedrock monitoring wells.
- Assessing the site's sewer and storm water drainage system.
- Collecting sewer and storm water samples from the site's sewer and storm water drainage system outfall pipes.
- Collecting sediment samples, if present, for subjective and laboratory analysis from the site's storm water drainage system.
- Performing hydraulic conductivity (slug) testing and water level gauging of monitoring wells.
- Collecting quality control source and field samples for laboratory analysis.
- Collecting wipe samples from hard surface and bulk samples of various building materials.
- Collecting equipment and material rinse blank samples.
- Collecting surface water samples for laboratory analysis.
- Collecting investigation-derived waste samples for laboratory analysis.

# 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 ensure 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.

# QAPP Worksheet #12 – Measurement Performance Criteria Table

This worksheet displays the data quality indicator, QC activity, matrix, and measurement performance criteria for both the sampling and analytical measurement systems.

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

# QAPP Worksheet #13 – Secondary Data Uses and Limitations Table

Secondary data and information that will be used for the project and their originating sources are identified. Analytical data obtained prior to this QAPP is presented.

| Data type | Source | Data uses relative to current project | Factors affecting the reliability of data and limitations on data use |
|---|---|---|---|
| Initial site characterization | C. T. Male | Data were used to characterize water and soil concentrations. | Data collected included requisite QA/QC samples. No limitations on data use. |
| Final Technical Report for the Bennington Municipal Sanitary Landfill Site | Weston Solutions, Inc. | Data may be used to characterize water and soil concentrations at the landfill. | Data collected has not been evaluated in regard to required QA/QC. |

# 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 and installing / soil probe sampling | C. T. Male / Barr | August 2017 | Ongoing | Field reports and sample results | Ongoing |
| Collecting soil, sediment, and groundwater samples | C. T. Male / Barr | August 2017 | Ongoing | Field reports and sample results | Ongoing |
| Chemical analysis | ELLE, Eaton IN, Eaton CA | August/September 2017 | Ongoing | Laboratory reports | Ongoing |
| Data evaluation / validation | Barr / Environmental Standards | After receipt of data reports | Ongoing | Interim summary report | Ongoing |
| Summarizing data | C. T. Male / Barr | After receipt of data reports | Ongoing | Telephone, email, progress reports | Ongoing |
| Site investigation report | C. T. Male / Barr | After receipt and review of relevant data reports | Ongoing | Notification to VTDEC | Ongoing |

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

Analytical data quality objectives are used to ensure 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. 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 is outlined in Worksheet #10 and will be specified in the site-specific work plans.

# QAPP Worksheet #18 – Sampling Locations and Methods

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

# 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 | Preparation/ Analytical Holding Time[2] |
|---|---|---|---|---|
| PFAS | Water, soil, sediment, wipe, other (e.g., building materials, residues) | 250 mL HDPE | Cool ≤6ºC, Trizma (drinking water only) | 14 days (water), 28 days (soil, sediment, wipe, other) until extraction; analysis within 28 days of extraction |
| Total Oxidizable Precursor (TOP) Assay | Water | 4-250 mL HDPE | Cool ≤6ºC | 14 days (lab defined) |
| TCL VOCs | Water | 3-40 mL glass volatile organic analysis (VOA) vials | HCl to pH<2, cool ≤6ºC, no headspace | 14 days (acid preserved), 7 days (unpreserved) |
| | Soil, sediment | 40 mL VOA vial or coring device kit | 1:1 solvent or zero headspace, cool ≤6ºC. Additional unpreserved for %moisture if solvent collection | 48 hours from sample collection to preservation; 14 days |
| TCL SVOCs | Water | 250 mL amber glass | Cool ≤6ºC | 7 days until extraction/analysis within 40 days of extraction |
| TCL SVOCs | Soil, sediment | 4 oz glass jar | Cool ≤6ºC | 14 days until extraction/analysis within 40 days of extraction |
| 1,4-Dioxane | Water | 250 mL amber glass | Cool ≤6ºC | 7 days until extraction/analysis within 40 days of extraction |
| TCL Pesticides | Water | 250 mL amber glass | Cool ≤6ºC | 7 days until extraction/analysis within 40 days of extraction |
| | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | 14 days until extraction/analysis within 40 days of extraction |
| TCL PCBs | Water | 250 mL amber glass | Cool ≤6ºC | None |
| | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | None |

| Analytical Group | Matrix | Containers (number, size & type per sample)[1] | Preservation | Preparation/ Analytical Holding Time[2] |
|---|---|---|---|---|
| PCB Homologs | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | NA |
| Metals (except mercury), hardness (water only) | Water | 250 mL plastic | pH <2 $HNO_3$ | 6 months |
| | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | 6 months |
| Mercury | Water | 250 mL plastic | pH <2 $HNO_3$ | 28 days |
| | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | 28 days |
| Cyanide, total | Water | 250 mL plastic | pH >10 NaOH, Cool ≤6ºC | 14 days |
| Cyanide, total | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | 14 days |
| Bromide, chloride, fluoride, nitrate as N, nitrite as N, sulfate | Water | 250 mL plastic | Cool ≤6ºC | 28 days |
| Alkalinity (total, carbonate, bicarbonate) | Water | 250 mL plastic | Cool ≤6ºC | 14 days |
| Ammonia, TKN | Water | 250 mL plastic | pH <2 $H_2SO_4$, Cool ≤6ºC | 28 days |
| Nitrate+nitrite as N | Water | 120 mL amber glass | pH <2 $H_2SO_4$, Cool ≤6ºC | 28 days |
| Orthophosphate | Water | 250 mL plastic | Cool ≤6ºC | 48 hrs., 15 min. field filtration |
| Uranium | Water | 500 mL plastic | pH <2 $HNO_3$ | 6 months |
| Gross alpha | Water | 500 mL plastic | pH <2 $HNO_3$ | 5 days to preservation or analysis/6 months preserved |
| Total coliforms | Water | 125 mL sterile | $Na_2S_2O_3$, Cool ≤6ºC | 30 hrs. |
| TOC | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | 28 days |
| pH | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | As soon as possible |
| % moisture | Soil, sediment | 4 oz. glass jar | Cool ≤6ºC | Not applicable |

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

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

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

# QAPP Worksheet #20 – Field Quality Control Summary

The site-specific work plans 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.

| Matrix | Analytical Group | No. of Field Duplicate Pairs | No. of MS/MSD | No. of Laboratory Trip Blanks | No. of Field Blanks | No. of Equip./Rinsate Blanks |
|---|---|---|---|---|---|---|
| Water, sediment, and soil | All analytical groups | 5% of total number sampled or one sample per media, whichever is greater | 5% of total number sampled per media | 5% of total number sampled (VOC, PFAS) per media | 5% of total number sampled per media | 5% of total number sampled per media |

# QAPP Worksheet #21 – Project Sampling SOP References

The field activities for this site will include collecting surface and subsurface soil, drinking water, surface water, groundwater, sediment, and storm water samples, and other matrices (e.g., building materials, residues) for laboratory analysis. The procedures relative to implementing these field activities are included in the site-specific work plans.

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

The field equipment calibration, maintenance, testing, and inspection information are included in the site-specific work plans.

# 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. Modifications to methods performed at ELLE are summarized below.

EPA 537 modifications for non-drinking water matrices.

- 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.
- Internal standards added post-extraction to calculate the recoveries of the isotopic analogs listed above.
- Additional PFAS analyzed than the EPA 537 list of compounds.
- Peak asymmetry factor not calculated as listed in EPA 537.
- 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 28 days used for solid matrices. EPA 537 only addresses holding times for drinking water samples.
- Qualitative branched isomer standard analyzed to evaluate branched peaks.

EPA 9045D modified for solid matrices.

- An Automatic Temperature Compensator is used for all samples instead of manually performing calculations to correct measured pH values if the sample and buffer solution temperatures differ by more than 2 °C.
- 25 g and 25 g reagent water are used instead of the 20 g and 20 mL ratio noted in the method.
- Samples are tumbled for approximately 30 minutes instead of stirred with a stir bar for 5 minutes.

SM 4500-NH3 B/C modified for water matrices.

- Samples are buffered at a pH > 9.5 instead of pH at 9.5 as specified in the method.

SM 5310B is a water method modified for use on solid matrices.

- Inorganic carbon is removed from a sample with phosphoric acid.
- Aliquot is heated in an oven at 75 °C.
- Remaining carbon is then oxidized to carbon dioxide, which is measured by a nondispersive infrared detector. The mass of carbon dioxide detected is proportional to the mass of TOC in the sample.

# QAPP Worksheet #24 – Analytical Instrument Calibration

The analytical instrument calibration information is included in the laboratory Quality Assurance Manual (QAM) and/or the appropriate SOP. These documents are retained at each laboratory's 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 the laboratory QAM and/or the appropriate SOP. These documents are retained at each laboratory's 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 Barr

**Laboratories:** ELLE of Lancaster, PA; Eaton IN of South Bend, IN; and Eaton CA of Monrovia, CA

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

**Number of days from reporting until sample disposal:** As documented in laboratory QAM

The field sampling plan 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.

# QAPP Worksheet #28 –Analytical Quality Control and Corrective Action

The analytical quality control and corrective action information are included in the laboratory QAM and/or the appropriate SOP. These documents are retained at each laboratory's 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.

| Sample Collection Documents and Records | Generation | Verification | Where Maintained |
|---|---|---|---|
| **Field Documents**<br>Field Notes<br>Field Sample Forms<br>COC Records<br>Field Instrument Calibration Logs<br>Sampling Notes<br>Photographs<br>HASP | C.T Male and Barr Field Staff | C.T. Male and Barr Project Manager | Field documents generated by C.T. Male field staff will be maintained in the project file located at C.T. Male offices.<br>Field documents generated by Barr field staff will be maintained in the project file located at Barr offices. |
| **Project Report Documents**<br>Project sign-off forms<br>Project report submittals | C.T Male and Barr Project Staff | C.T. Male and Barr 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 Barr offices which are kept following Barr's Records Management Protocols. |
| **Laboratory Documents**<br>Sample receipt, custody, and tracking record<br>Equipment calibration logs (electronically stored)<br>Sample preparation logs (electronically stored)<br>Analysis Run Logs (electronically stored)<br>Raw data | Laboratory Project Manager | Laboratory QA Manager | As detailed in the laboratory QAM(s), data is typically retained for a period of 5 years from the report date. |

| Sample Collection Documents and Records | Generation | Verification | Where Maintained |
|---|---|---|---|
| **Correspondence** | C.T. Male and Barr Project Staff | C.T. Male Project Manager and Barr Project Manager | Project communications regarding the work plans, QAPP and schedule will be kept at C. T. Male offices, following C.T. Male's Records Management protocols, and in the project file at Barr offices, following Barr's Records Management Protocols. |

| Laboratory Data Deliverables | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Laboratory Record** | **PFAS/TOP** | **VOC** | **SVOC** | **Pesticides** | **PCB** | **Metals** | **Other (non-organic)** |
| Narrative | X | X | X | X | X | X | X |
| COC and any additional receiving documentation | X | X | X | X | X | X | X |
| Sample Results | X | X | X | X | X | X | X |
| QC Results | X | X | X | X | X | X | X |
| Raw Data (including but not limited to the following where appropriate - preparation logs, tune checks, initial calibrations, DDT/Endrin breakdown, instrument logs, tailing factor, chromatograms) | X | X | X | 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 for work completed by C.T. Male<br>Barr - QA Manager and/or Project Manager for work completed by Barr | As warranted | As warranted | On-site audit | 1 month from completion |
| Review of field notes/deviations from work plans | C.T. Male – QA Manager and/or Project Manager for work completed by C.T. Male<br>Barr – QA Manager and/or Project Manager for work completed by Barr | Every event/report | Ongoing | Documentation of review | Ongoing |
| Review of COCs | C.T. Male - QA Manager / Laboratory for samples collected by C.T. Male<br>Barr - QA Manager and/or Project Manager for samples collected by Barr | Every event/report | Within 5 days of receipt | Documentation of review | Ongoing |
| Review/validation analytical reports | Environmental Standards, Inc. | Level IIA every event/report and Level IV determined on a case by case basis. | Ongoing | Documentation of review | 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<br>Barr - QA Manager and/or Project Manager for work completed by Barr | Note on COC | Immediately to within 3 days of discrepancy | QA Manager, C.T. Male<br>Barr - QA Manager and/or Project Manager for work completed by Barr | QA Manager, C.T. Male<br>Barr - QA Manager and/or Project Manager for work completed by Barr |
| Review analytical reports | Barr – QA Manager | QA/QC Summary Sheet | Immediately to within 3 days of discrepancy | QA Manager, C.T. Male<br>Project Manager, Laboratory | QA Manager, C.T. Male<br>Project Manager, Laboratory |
| Review Validation Analytical Reports | Laboratory / Environmental Standards | QA/QC Summary Sheet | Immediately to within 3 days of discrepancy | QA Manager, C.T. Male<br>Project Manager, Laboratory | QA Manager, C.T. Male<br>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 | 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) |
|---|---|---|---|
| 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 | 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 for working completed by C.T. Male field staff.<br><br>Barr Project Manager for working completed by Barr 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 for working completed by C.T. Male field staff.<br><br>Barr Project Manager for working completed by Barr field staff. |

# 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 analytical data and prepare a report documenting if the analytical data is 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. The data validation company for this project are Environmental Standards Inc.

# 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 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:

- For work completed by C.T. Male - C.T. Male Project Manager, C.T. Male QA Manager
- For work completed by Barr - Barr Project Manager, Barr 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 C.T. Male QA Manager upon receipt.

| | |
|---|---|
| **Step 1** | **Review the project's objectives and sampling design**<br>Review the key outputs defined during systematic planning (i.e., DQOs) to make sure 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**<br>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**<br>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**<br>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**<br>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

Intergovernmental Data Quality Task Force Uniform Federal Policy, 2012. *Uniform Federal Policy for Quality Assurance Project Plans – Part 2A (Revised).* EPA-505-B-04-900C. March 2012.

United States Environmental Protection Agency, 2006. *EPA Requirements for Quality Assurance Project Plans.* EPA QA/R-5. 2006

United States Environmental Protection Agency. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review.*

# Tables

**Table 1**
**Laboratory Analyses**
**Bennington, VT QAPP Revision 1**

| | |
|---|---|
| Eurofins Lancaster Laboratories, LLC. (ELLE)<br>2425 New Holland Pike<br>Lancaster, Pennsylvania 17605 | <u>Drinking Water</u><br>Metals – EPA 200.7 / EPA 200.8<br>Total Hardness – SM 2340 C<br>Chloride, fluoride, and sulfate – EPA 300.0<br>Nitrate as N and nitrite as N – EPA 353.2<br>Alkalinity (total, carbonate, bicarbonate) – SM 2320 B<br>Total Coliforms – SM 9223 B<br><br><u>Other Matrices</u><br>TCL VOCs (soil and water) – EPA 8260<br>TCL SVOCs (soil and water) – EPA 8270<br>1,4-Dioxane (water) – EPA 8270 SIM<br>TCL Pesticides (soil and water) – EPA 8081<br>TCL PCBs (soil and water) – EPA 8082<br>Metals (soil and water) – EPA 6010 / EPA 6020<br>Mercury (soil and water) – EPA 7471 / EPA 7470<br>Cyanide (soil and water) – EPA 9012<br>PFAS (soil, water, and wipe) – EPA 537 modified<br>TOP Assay (water) – EPA 537 modified<br>Bromide, chloride, nitrate as N, nitrite as N, sulfate (water) – EPA 300.0<br>Alkalinity (total, carbonate, bicarbonate) (water) – SM 2320 B<br>Ammonia (water) – SM 4500-NH3 B/C modified<br>Orthophosphate (water) – SM 4500-P E<br>Total Kjeldahl Nitrogen (TKN) (water) – EPA 351.2<br>Total Organic Carbon (TOC) (soil) – SM 5310 B modified<br>PCB Homologs (soil) – EPA 680<br>pH (soil) – EPA 9045 modified<br>% moisture (soil) – SM 2540 G |
| Eurofins Eaton Analytical, Inc. (Eaton IN)*<br>110 South Hill Street<br>South Bend, IN 46647 | <u>Drinking Water</u><br>PFAS – EPA 537 |
| Eurofins Eaton Laboratories, LLC. (Eaton CA)<br>750 Royal Oaks Drive, Suite 100<br>Monrovia, CA 91016 | <u>Drinking Water</u><br>Uranium – EPA 200.8<br>Gross alpha – EPA 900.0 |

* Eaton IN will supply the containers for the Eaton CA work and samples will be submitted to them at the address above. Eaton IN will then subcontract applicable work to Eaton CA.

**Table 2A**
**Drinking Water Investigation and Replacement Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameters | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| **Investigation Samples** | | | | | | |
| **Perfluorinated Compounds *** | | | | | | |
| N-ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA) | EPA 537 | 0.58 | 2.0 | ng/L | Low = 50-150<br>Medium = 70-130<br>High = 70-130 | Low = 50-150<br>Medium = 70-130<br>High = 70-130 |
| N-methyl Perfluorooctanesulfonamidoacetic acid (NMeFOSAA) | EPA 537 | 0.60 | 2.0 | ng/L | | |
| Perfluorobutanesulfonic acid (PFBS) | EPA 537 | 0.36 | 2.0 | ng/L | | |
| Perfluorodecanoic acid (PFDA) | EPA 537 | 0.38 | 2.0 | ng/L | | |
| Perfluorolauric acid (Perfluorododecanoic acid) (PFDoA) | EPA 537 | 0.28 | 2.0 | ng/L | | |
| Perfluoroheptanoic acid (PFHpA) | EPA 537 | 0.44 | 2.0 | ng/L | | |
| Perfluorohexanesulfonic acid (PFHxS) | EPA 537 | 0.37 | 2.0 | ng/L | | |
| Perfluorohexanoic acid (PFHxA) | EPA 537 | 0.54 | 2.0 | ng/L | | |
| Perfluorononanoic acid (PFNA) | EPA 537 | 0.33 | 2.0 | ng/L | | |
| Perfluorooctanesulfonic acid (PFOS) | EPA 537 | 0.26 | 2.0 | ng/L | | |
| Perfluorooctanoic acid (PFOA) | EPA 537 | 0.43 | 2.0 | ng/L | | |
| Perfluoromyristic acid (Perfluorotetradecanoic acid) (PFTA) | EPA 537 | 0.21 | 2.0 | ng/L | | |
| Perfluorotridecanoic acid (PFTrDA) | EPA 537 | 0.29 | 2.0 | ng/L | | |
| Perfluoroundecanoic acid (PFUnA) | EPA 537 | 0.33 | 2.0 | ng/L | | |
| **Vermont Department of Health Recommendations for New Water Wells** | | | | | | |
| Arsenic | EPA 200.8 rev 5.4 | 0.72 | 2 | ug/L | 70-130 | 85-115 |
| Copper | EPA 200.8 rev 5.4 | 0.54 | 2 | ug/L | 70-130 | 85-115 |
| Calcium | EPA 200.7 rev 4.4 | 60 | 200 | ug/L | 70-130 | 85-115 |
| Iron | EPA 200.7 rev 4.4 | 80.5 | 200 | ug/L | 70-130 | 85-115 |
| Lead | EPA 200.8 rev 5.4 | 0.11 | 1 | ug/L | 70-130 | 85-115 |
| Magnesium | EPA 200.7 rev 4.4 | 37.4 | 100 | ug/L | 70-130 | 85-115 |
| Manganese | EPA 200.8 rev 5.4 | 0.9 | 2 | ug/L | 70-130 | 85-115 |
| Sodium | EPA 200.7 rev 4.4 | 321 | 1000 | ug/L | 70-130 | 85-115 |
| Uranium ** | EPA 200.8 | 0.05698 | 1 | ug/L | 70-130 | 85-115 |
| Total Hardness | SM 2340 C-1997 | 3 | 10 | mg/l as CaCO3 | 90-110 | 90-110 |
| Chloride | EPA 300.0 | 1 | 2 | mg/L | 90-110 | 90-110 |
| Fluoride | EPA 300.0 | 0.25 | 0.5 | mg/L | 90-110 | 90-110 |
| Nitrate Nitrogen | EPA 353.2 | 0.2 | 0.5 | mg/L | 90-110 | 90-110 |
| Nitrite Nitrogen | EPA 353.2 | 0.075 | 0.25 | mg/L | 90-110 | 90-110 |
| Gross Alpha ** | EPA 900.0 | 2.68 | 3 | pCi/L | 70-130 | 80-120 |
| Total Coliform | SM 9223 B-1997 | = | - | count/100 mL | - | - |

**Table 2A**

**Drinking Water Investigation and Replacement Parameters and Limits**

**Saint-Gobain Performance Plastics**

**Bennington, VT QAPP Revision 1**

| Parameters | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|

*Reporting limits and statistical QC windows are evaluated annually and are subject to change.*

* Samples analyzed at Eaton IN

** Subcontracted to Eaton CA

MDL - Method Detection Limit

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| **Metals** | | | | | | |
| Aluminum | SW-846 6010C | 0.0894 | 0.4 | mg/l | 75-125 | 80-120 |
| Antimony | SW-846 6020A | 0.00045 | 0.002 | mg/l | 75-125 | 80-120 |
| Arsenic | SW-846 6020A | 0.00072 | 0.004 | mg/l | 75-125 | 80-120 |
| Barium | SW-846 6020A | 0.00072 | 0.004 | mg/l | 75-125 | 80-120 |
| Beryllium | SW-846 6020A | 0.000071 | 0.001 | mg/l | 75-125 | 80-120 |
| Boron | SW-846 6010C | 0.0101 | 0.1 | mg/l | 75-125 | 80-120 |
| Cadmium | SW-846 6020A | 0.00015 | 0.001 | mg/l | 75-125 | 80-120 |
| Calcium * | SW-846 6010C | 0.06 | 0.4 | mg/l | 75-125 | 80-120 |
| Chromium | SW-846 6020A | 0.00087 | 0.004 | mg/l | 75-125 | 80-120 |
| Cobalt | SW-846 6020A | 0.00016 | 0.001 | mg/l | 75-125 | 80-120 |
| Copper | SW-846 6020A | 0.00054 | 0.004 | mg/l | 75-125 | 80-120 |
| Cyanide | SW-846 9012A | 0.005 | 0.01 | mg/l | 72-114 | 90-110 |
| Iron * | SW-846 6010C | 0.0805 | 0.4 | mg/l | 75-125 | 80-120 |
| Lead | SW-846 6020A | 0.00011 | 0.002 | mg/l | 75-125 | 80-120 |
| Magnesium * | SW-846 6010C | 0.0374 | 0.2 | mg/l | 75-125 | 80-120 |
| Manganese * | SW-846 6020A | 0.0009 | 0.004 | mg/l | 75-125 | 80-120 |
| Mercury | SW-846 7470A | 0.00005 | 0.0002 | mg/l | 80-120 | 80-120 |
| Nickel | SW-846 6020A | 0.001 | 0.004 | mg/l | 75-125 | 80-120 |
| Potassium * | SW-846 6010C | 0.179 | 1 | mg/l | 75-125 | 80-120 |
| Selenium | SW-846 6020A | 0.0005 | 0.004 | mg/l | 75-125 | 80-120 |
| Silver | SW-846 6020A | 0.00012 | 0.001 | mg/l | 75-125 | 80-120 |
| Sodium * | SW-846 6010C | 0.321 | 2 | mg/l | 75-125 | 80-120 |
| Thallium | SW-846 6020A | 0.00012 | 0.001 | mg/l | 75-125 | 80-120 |
| Vanadium | SW-846 6020A | 0.00021 | 0.001 | mg/l | 75-125 | 80-120 |
| Zinc | SW-846 6010C | 0.0065 | 0.04 | mg/l | 75-125 | 80-120 |
| **General Parameters** | | | | | | |
| Ammonia | SM 4500-NH3 B/C modified-1997 | 0.2 | 0.6 | mg/l | 93-100 | 93-100 |
| Orthophosphate ** | SM 4500-P E-1999 | 0.03 | 0.09 | mg/l | 69-131 | 95-105 |
| Total Kjeldahl Nitrogen (TKN) | EPA 351.2 | 0.5 | 1 | mg/l | 90-110 | 90-110 |
| **Perfluorinated Compounds** | | | | | | |
| Perfluorobutanoic acid (PFBA) | EPA 537 Version 1.1 Modified^ | 3 | 10 | ng/l | 70-130 | 70-130 |
| Perfluorobutanesulfonate (PFBS) | EPA 537 Version 1.1 Modified^ | 0.8 | 3 | ng/l | 70-130 | 70-130 |
| Perfluorodecanoic acid (PFDA) | EPA 537 Version 1.1 Modified^ | 0.5 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorododecanoic acid (PFDoA) | EPA 537 Version 1.1 Modified^ | 0.5 | 2 | ng/l | 70-130 | 70-130 |
| Perfluoroheptanoic acid (PFHpA) | EPA 537 Version 1.1 Modified^ | 0.5 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorohexanoic acid (PFHxA) | EPA 537 Version 1.1 Modified^ | 0.6 | 2 | ng/l | 70-130 | 70-130 |

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| Perfluorohexanesulfonate (PFHxS) | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| Perfluorononanoic acid (PFNA) | EPA 537 Version 1.1 Modified^ | 0.6 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorooctanoic acid (PFOA) | EPA 537 Version 1.1 Modified^ | 0.6 | 2 | ng/l | 70-130 | 70-130 |
| Perfluoro-octanesulfonate (PFOS) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng/l | 70-130 | 70-130 |
| Perfluoropentanoic acid (PFPA) | EPA 537 Version 1.1 Modified^ | 0.5 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorotetradecanoic acid (PFTA) | EPA 537 Version 1.1 Modified^ | 0.5 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorotridecanoic acid (PFTriA) | EPA 537 Version 1.1 Modified^ | 0.5 | 2 | ng/l | 70-130 | 70-130 |
| Perfluoroundecanoic acid (PFUnA) | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| Perfluorooctane sulfonamide (PFOSA) | EPA 537 Version 1.1 Modified^ | 3 | 9 | ng/l | 70-130 | 70-130 |
| 6:2 Fluorotelomer sulfonate | EPA 537 Version 1.1 Modified^ | 3 | 10 | ng/l | 70-130 | 70-130 |
| 8:2 Fluorotelomer sulfonate | EPA 537 Version 1.1 Modified^ | 4 | 10 | ng/l | 70-130 | 70-130 |
| NMeFOSAA | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| NEtFOSAA | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| **Total Oxidizable Precursor (TOP) Compounds** | | | | | | |
| Perfluorobutanoic acid (PFBA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng/l | 70-130 | 70-130 |
| Perfluorobutanesulfonate (PFBS) | EPA 537 Version 1.1 Modified^ | 0.3 | 1 | ng/l | 70-130 | 70-130 |
| Perfluorodecanoic acid (PFDA) | EPA 537 Version 1.1 Modified^ | 1 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorododecanoic acid (PFDoA) | EPA 537 Version 1.1 Modified^ | 0.3 | 1 | ng/l | 70-130 | 70-130 |
| Perfluoroheptanoic acid (PFHpA) | EPA 537 Version 1.1 Modified^ | 0.3 | 1 | ng/l | 70-130 | 70-130 |
| Perfluorohexanoic acid (PFHxA) | EPA 537 Version 1.1 Modified^ | 0.4 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorohexanesulfonate (PFHxS) | EPA 537 Version 1.1 Modified^ | 0.4 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorononanoic acid (PFNA) | EPA 537 Version 1.1 Modified^ | 0.4 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorooctanoic acid (PFOA) | EPA 537 Version 1.1 Modified^ | 0.3 | 1 | ng/l | 70-130 | 70-130 |
| Perfluoro-octanesulfonate (PFOS) | EPA 537 Version 1.1 Modified^ | 0.4 | 2 | ng/l | 70-130 | 70-130 |
| Perfluoropentanoic acid (PFPA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng/l | 70-130 | 70-130 |
| Perfluorotetradecanoic acid (PFTA) | EPA 537 Version 1.1 Modified^ | 0.3 | 1 | ng/l | 70-130 | 70-130 |
| Perfluorotridecanoic acid (PFTriA) | EPA 537 Version 1.1 Modified^ | 0.3 | 1 | ng/l | 70-130 | 70-130 |
| Perfluoroundecanoic acid (PFUnA) | EPA 537 Version 1.1 Modified^ | 0.4 | 2 | ng/l | 70-130 | 70-130 |
| Perfluorooctane sulfonamide (PFOSA) | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| 6:2 Fluorotelomer sulfonate | EPA 537 Version 1.1 Modified^ | 3 | 9 | ng/l | 70-130 | 70-130 |
| 8:2 Fluorotelomer sulfonate | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng/l | 70-130 | 70-130 |
| NMeFOSAA | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| NEtFOSAA | EPA 537 Version 1.1 Modified^ | 1 | 3 | ng/l | 70-130 | 70-130 |
| **Anions** | | | | | | |
| Bromide | EPA 300.0 | 1.25 | 2.5 | mg/l | 90-110 | 90-110 |
| Chloride | EPA 300.0 | 1 | 2 | mg/l | 90-110 | 90-110 |
| Nitrate Nitrogen | EPA 300.0 | 0.25 | 0.5 | mg/l | 90-110 | 90-110 |

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| Nitrite Nitrogen | EPA 300.0 | 0.25 | 0.5 | mg/l | 90-110 | 90-110 |
| Sulfate | EPA 300.0 | 1.5 | 5 | mg/l | 90-110 | 90-110 |
| Total alkalinity (Carbonate, Bicarbonate) | SM 2320 B-1997 | 1.7 | 5 | mg/l as CaCO3 | 77-114 | 77-114 |
| **TCL VOCs - Water** | | | | | | |
| 1,1,1-Trichloroethane | SW-846 8260C | 0.5 | 1 | ug/l | 67-120 | 67-120 |
| 1,1,2,2-Tetrachloroethane | SW-846 8260C | 0.5 | 1 | ug/l | 72-120 | 72-120 |
| 1,1,2-Trichloroethane | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| 1,1-Dichloroethane | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| 1,1-Dichloroethene | SW-846 8260C | 0.5 | 1 | ug/l | 76-124 | 76-124 |
| 1,2,3-Trichlorobenzene | SW-846 8260C | 1 | 5 | ug/l | 51-120 | 51-120 |
| 1,2,4-Trichlorobenzene | SW-846 8260C | 1 | 5 | ug/l | 58-120 | 58-120 |
| 1,2-Dibromo-3-chloropropane | SW-846 8260C | 2 | 5 | ug/l | 59-120 | 59-120 |
| 1,2-Dibromoethane | SW-846 8260C | 0.5 | 1 | ug/l | 75-120 | 75-120 |
| 1,2-Dichlorobenzene | SW-846 8260C | 1 | 5 | ug/l | 80-120 | 80-120 |
| 1,2-Dichloroethane | SW-846 8260C | 0.5 | 1 | ug/l | 66-128 | 66-128 |
| 1,2-Dichloropropane | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| 1,3-Dichlorobenzene | SW-846 8260C | 1 | 5 | ug/l | 80-120 | 80-120 |
| 1,4-Dichlorobenzene | SW-846 8260C | 1 | 5 | ug/l | 80-120 | 80-120 |
| 2-Butanone | SW-846 8260C | 3 | 10 | ug/l | 53-140 | 53-140 |
| 2-Hexanone | SW-846 8260C | 3 | 10 | ug/l | 49-137 | 49-137 |
| 4-Methyl-2-pentanone | SW-846 8260C | 3 | 10 | ug/l | 56-131 | 56-131 |
| Acetone | SW-846 8260C | 6 | 20 | ug/l | 50-168 | 50-168 |
| Benzene | SW-846 8260C | 0.5 | 1 | ug/l | 78-120 | 78-120 |
| Bromochloromethane | SW-846 8260C | 1 | 5 | ug/l | 80-125 | 80-125 |
| Bromodichloromethane | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| Bromoform | SW-846 8260C | 0.5 | 4 | ug/l | 64-120 | 64-120 |
| Bromomethane | SW-846 8260C | 0.5 | 1 | ug/l | 49-121 | 49-121 |
| Carbon Disulfide | SW-846 8260C | 1 | 5 | ug/l | 63-122 | 63-122 |
| Carbon Tetrachloride | SW-846 8260C | 0.5 | 1 | ug/l | 76-123 | 76-123 |
| Chlorobenzene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| Chloroethane | SW-846 8260C | 0.5 | 1 | ug/l | 51-121 | 51-121 |
| Chloroform | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| Chloromethane | SW-846 8260C | 0.5 | 1 | ug/l | 57-120 | 57-120 |
| Cyclohexane | SW-846 8260C | 2 | 5 | ug/l | 67-121 | 67-121 |
| Dibromochloromethane | SW-846 8260C | 0.5 | 1 | ug/l | 78-120 | 78-120 |
| Dichlorodifluoromethane | SW-846 8260C | 0.5 | 1 | ug/l | 54-122 | 54-122 |
| Ethylbenzene | SW-846 8260C | 0.5 | 1 | ug/l | 78-120 | 78-120 |

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| Freon 113 | SW-846 8260C | 2 | 10 | ug/l | 68-129 | 68-129 |
| Isopropylbenzene | SW-846 8260C | 1 | 5 | ug/l | 80-120 | 80-120 |
| Methyl Acetate | SW-846 8260C | 1 | 5 | ug/l | 61-137 | 61-137 |
| Methyl Tertiary Butyl Ether | SW-846 8260C | 0.5 | 1 | ug/l | 75-120 | 75-120 |
| Methylcyclohexane | SW-846 8260C | 1 | 5 | ug/l | 66-126 | 66-126 |
| Methylene Chloride | SW-846 8260C | 2 | 4 | ug/l | 80-120 | 80-120 |
| Styrene | SW-846 8260C | 1 | 5 | ug/l | 80-120 | 80-120 |
| Tetrachloroethene | SW-846 8260C | 0.5 | 1 | ug/l | 80-129 | 80-129 |
| Toluene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| Trichloroethene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| Trichlorofluoromethane | SW-846 8260C | 0.5 | 1 | ug/l | 57-134 | 57-134 |
| Vinyl Chloride | SW-846 8260C | 0.5 | 1 | ug/l | 63-121 | 63-121 |
| Xylene (Total) | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| cis-1,2-Dichloroethene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| cis-1,3-Dichloropropene | SW-846 8260C | 0.5 | 1 | ug/l | 75-120 | 75-120 |
| m+p-Xylene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| o-Xylene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| trans-1,2-Dichloroethene | SW-846 8260C | 0.5 | 1 | ug/l | 80-120 | 80-120 |
| trans-1,3-Dichloropropene | SW-846 8260C | 0.5 | 1 | ug/l | 76-120 | 76-120 |
| **SVOCs** | | | | | | |
| 1,4-Dioxane | SW-846 8270D SIM | 0.05 | 0.2 | ug/l | 70-130 | 70-130 |
| 1,1'-Biphenyl | SW-846 8270D | 0.5 | 1 | ug/l | 65-107 | 65-107 |
| 1,2,4,5-Tetrachlorobenzene | SW-846 8270D | 0.5 | 1 | ug/l | 50-108 | 50-108 |
| 1,4-Dioxane | SW-846 8270D | 1 | 5 | ug/l | 28-56 | 28-56 |
| 2,2'-oxybis(1-Chloropropane) | SW-846 8270D | 0.5 | 1 | ug/l | 54-113 | 54-113 |
| 2,3,4,6-Tetrachlorophenol | SW-846 8270D | 0.5 | 1 | ug/l | 69-125 | 69-125 |
| 2,4,5-Trichlorophenol | SW-846 8270D | 0.5 | 1 | ug/l | 75-118 | 75-118 |
| 2,4,6-Trichlorophenol | SW-846 8270D | 0.5 | 1 | ug/l | 75-118 | 75-118 |
| 2,4-Dichlorophenol | SW-846 8270D | 0.5 | 1 | ug/l | 71-113 | 71-113 |
| 2,4-Dimethylphenol | SW-846 8270D | 0.5 | 1 | ug/l | 53-93 | 53-93 |
| 2,4-Dinitrophenol | SW-846 8270D | 10 | 30 | ug/l | 33-133 | 33-133 |
| 2,4-Dinitrotoluene | SW-846 8270D | 1 | 5 | ug/l | 70-122 | 70-122 |
| 2,6-Dinitrotoluene | SW-846 8270D | 0.5 | 1 | ug/l | 75-121 | 75-121 |
| 2-Chloronaphthalene | SW-846 8270D | 0.4 | 1 | ug/l | 59-109 | 59-109 |
| 2-Chlorophenol | SW-846 8270D | 0.5 | 1 | ug/l | 62-105 | 62-105 |
| 2-Methylnaphthalene | SW-846 8270D | 0.1 | 0.5 | ug/l | 54-111 | 54-111 |
| 2-Methylphenol | SW-846 8270D | 0.5 | 1 | ug/l | 57-105 | 57-105 |

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| 2-Nitroaniline | SW-846 8270D | 0.5 | 1 | ug/l | 74-121 | 74-121 |
| 2-Nitrophenol | SW-846 8270D | 0.5 | 1 | ug/l | 68-120 | 68-120 |
| 3,3'-Dichlorobenzidine | SW-846 8270D | 2 | 5 | ug/l | 37-104 | 37-104 |
| 3-Nitroaniline | SW-846 8270D | 0.5 | 1 | ug/l | 61-114 | 61-114 |
| 4,6-Dinitro-2-methylphenol | SW-846 8270D | 5 | 15 | ug/l | 59-125 | 59-125 |
| 4-Bromophenyl-phenylether | SW-846 8270D | 0.5 | 1 | ug/l | 71-114 | 71-114 |
| 4-Chloro-3-methylphenol | SW-846 8270D | 0.5 | 1 | ug/l | 72-116 | 72-116 |
| 4-Chloroaniline | SW-846 8270D | 2 | 4 | ug/l | 42-99 | 42-99 |
| 4-Chlorophenyl-phenylether | SW-846 8270D | 0.5 | 1 | ug/l | 65-112 | 65-112 |
| 4-Methylphenol | SW-846 8270D | 0.5 | 1 | ug/l | 51-100 | 51-100 |
| 4-Nitroaniline | SW-846 8270D | 0.5 | 1 | ug/l | 60-106 | 60-106 |
| 4-Nitrophenol | SW-846 8270D | 10 | 30 | ug/l | 18-91 | 18-91 |
| Acenaphthene | SW-846 8270D | 0.1 | 0.5 | ug/l | 68-112 | 68-112 |
| Acenaphthylene | SW-846 8270D | 0.1 | 0.5 | ug/l | 67-111 | 67-111 |
| Acetophenone | SW-846 8270D | 0.5 | 1 | ug/l | 71-108 | 71-108 |
| Anthracene | SW-846 8270D | 0.1 | 0.5 | ug/l | 73-113 | 73-113 |
| Atrazine | SW-846 8270D | 2 | 5 | ug/l | 80-120 | 80-120 |
| Benzaldehyde | SW-846 8270D | 1 | 5 | ug/l | 58-107 | 58-107 |
| Benzo(a)anthracene | SW-846 8270D | 0.1 | 0.5 | ug/l | 74-124 | 74-124 |
| Benzo(a)pyrene | SW-846 8270D | 0.1 | 0.5 | ug/l | 70-113 | 70-113 |
| Benzo(b)fluoranthene | SW-846 8270D | 0.1 | 0.5 | ug/l | 72-117 | 72-117 |
| Benzo(g,h,i)perylene | SW-846 8270D | 0.1 | 0.5 | ug/l | 64-117 | 64-117 |
| Benzo(k)fluoranthene | SW-846 8270D | 0.1 | 0.5 | ug/l | 73-121 | 73-121 |
| bis(2-Chloroethoxy)methane | SW-846 8270D | 0.5 | 1 | ug/l | 72-116 | 72-116 |
| bis(2-Chloroethyl)ether | SW-846 8270D | 0.5 | 1 | ug/l | 63-108 | 63-108 |
| bis(2-Ethylhexyl)phthalate | SW-846 8270D | 2 | 5 | ug/l | 64-126 | 64-126 |
| Butylbenzylphthalate | SW-846 8270D | 2 | 5 | ug/l | 52-121 | 52-121 |
| Caprolactam | SW-846 8270D | 5 | 15 | ug/l | 13-37 | 13-37 |
| Carbazole | SW-846 8270D | 0.5 | 1 | ug/l | 79-116 | 79-116 |
| Chrysene | SW-846 8270D | 0.1 | 0.5 | ug/l | 75-120 | 75-120 |
| Di-n-butylphthalate | SW-846 8270D | 2 | 5 | ug/l | 69-117 | 69-117 |
| Di-n-octylphthalate | SW-846 8270D | 2 | 5 | ug/l | 68-127 | 68-127 |
| Dibenz(a,h)anthracene | SW-846 8270D | 0.1 | 0.5 | ug/l | 68-121 | 68-121 |
| Dibenzofuran | SW-846 8270D | 0.5 | 1 | ug/l | 69-110 | 69-110 |
| Diethylphthalate | SW-846 8270D | 2 | 5 | ug/l | 55-113 | 55-113 |
| Dimethylphthalate | SW-846 8270D | 2 | 5 | ug/l | 19-119 | 19-119 |
| Fluoranthene | SW-846 8270D | 0.1 | 0.5 | ug/l | 75-117 | 75-117 |

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| Fluorene | SW-846 8270D | 0.1 | 0.5 | ug/l | 68-112 | 68-112 |
| Hexachlorobenzene | SW-846 8270D | 0.1 | 0.5 | ug/l | 66-115 | 66-115 |
| Hexachlorobutadiene | SW-846 8270D | 0.5 | 1 | ug/l | 27-111 | 27-111 |
| Hexachlorocyclopentadiene | SW-846 8270D | 5 | 15 | ug/l | 10-81 | 10-81 |
| Hexachloroethane | SW-846 8270D | 1 | 5 | ug/l | 28-103 | 28-103 |
| Indeno(1,2,3-cd)pyrene | SW-846 8270D | 0.1 | 0.5 | ug/l | 67-117 | 67-117 |
| Isophorone | SW-846 8270D | 0.5 | 1 | ug/l | 70-117 | 70-117 |
| N-Nitroso-di-n-propylamine | SW-846 8270D | 0.5 | 1 | ug/l | 67-115 | 67-115 |
| N-Nitrosodiphenylamine | SW-846 8270D | 0.5 | 1 | ug/l | 75-116 | 75-116 |
| Naphthalene | SW-846 8270D | 0.1 | 0.5 | ug/l | 54-109 | 54-109 |
| Nitrobenzene | SW-846 8270D | 0.5 | 1 | ug/l | 66-114 | 66-114 |
| Pentachlorophenol | SW-846 8270D | 1 | 5 | ug/l | 59-134 | 59-134 |
| Phenanthrene | SW-846 8270D | 0.1 | 0.5 | ug/l | 72-110 | 72-110 |
| Phenol | SW-846 8270D | 0.5 | 1 | ug/l | 16-80 | 16-80 |
| Pyrene | SW-846 8270D | 0.1 | 0.5 | ug/l | 72-109 | 72-109 |
| **Pesticides** | | | | | | |
| Aldrin | SW-846 8081B | 0.002 | 0.01 | ug/l | 28-119 | 28-119 |
| Alpha BHC | SW-846 8081B | 0.003 | 0.01 | ug/l | 47-132 | 47-132 |
| Alpha Chlordane | SW-846 8081B | 0.003 | 0.01 | ug/l | 53-126 | 53-126 |
| Beta BHC | SW-846 8081B | 0.0034 | 0.01 | ug/l | 56-125 | 56-125 |
| Delta BHC | SW-846 8081B | 0.0034 | 0.01 | ug/l | 76-126 | 49-140 |
| Dieldrin | SW-846 8081B | 0.0053 | 0.02 | ug/l | 54-126 | 54-126 |
| Endosulfan I | SW-846 8081B | 0.0043 | 0.01 | ug/l | 40-138 | 40-138 |
| Endosulfan II | SW-846 8081B | 0.015 | 0.03 | ug/l | 54-124 | 54-124 |
| Endosulfan Sulfate | SW-846 8081B | 0.0058 | 0.02 | ug/l | 41-133 | 41-133 |
| Endrin | SW-846 8081B | 0.0081 | 0.02 | ug/l | 35-143 | 35-143 |
| Endrin Aldehyde | SW-846 8081B | 0.02 | 0.1 | ug/l | 40-135 | 40-135 |
| Endrin Ketone | SW-846 8081B | 0.005 | 0.02 | ug/l | 44-136 | 44-136 |
| Gamma BHC - Lindane | SW-846 8081B | 0.002 | 0.01 | ug/l | 51-132 | 51-132 |
| Gamma Chlordane | SW-846 8081B | 0.007 | 0.02 | ug/l | 53-130 | 53-130 |
| Heptachlor | SW-846 8081B | 0.002 | 0.01 | ug/l | 38-135 | 38-135 |
| Heptachlor Epoxide | SW-846 8081B | 0.0023 | 0.01 | ug/l | 56-132 | 56-132 |
| Methoxychlor | SW-846 8081B | 0.03 | 0.1 | ug/l | 39-143 | 39-143 |
| p,p-DDD | SW-846 8081B | 0.005 | 0.02 | ug/l | 67-123 | 42-148 |
| p,p-DDE | SW-846 8081B | 0.005 | 0.02 | ug/l | 51-129 | 51-129 |
| p,p-DDT | SW-846 8081B | 0.0052 | 0.02 | ug/l | 66-119 | 40-145 |
| Toxaphene | SW-846 8081B | 0.3 | 1 | ug/l | 48-148 | NA |

**Table 2B**
**Groundwater Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| **PCBs** | | | | | | |
| Aroclor-1016 | SW-846 8082A | 0.1 | 0.5 | ug/l | 60-117 | 60-117 |
| Aroclor-1221 | SW-846 8082A | 0.1 | 0.5 | ug/l | 80-120 | NA |
| Aroclor-1232 | SW-846 8082A | 0.2 | 0.5 | ug/l | 80-120 | NA |
| Aroclor-1242 | SW-846 8082A | 0.1 | 0.5 | ug/l | 75-125 | 75-125 |
| Aroclor-1248 | SW-846 8082A | 0.1 | 0.5 | ug/l | 68-149 | 58-112 |
| Aroclor-1254 | SW-846 8082A | 0.1 | 0.5 | ug/l | 50-130 | 60-130 |
| Aroclor-1260 | SW-846 8082A | 0.15 | 0.5 | ug/l | 57-134 | 57-134 |
| Aroclor-1262 | SW-846 8082A | 0.2 | 0.5 | ug/l | - | NA |
| Aroclor-1268 | SW-846 8082A | 0.16 | 0.5 | ug/l | - | NA |

* Cations

*Reporting limits and statistical QC windows are evaluated annually and are subject to change.*

** Orthophosphate ***must*** be filtered within 15 min of collection to meet regulatory requirements

^ Modifications to methods are summarized in Worksheet #23

MDL - Method Detection Limit

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

**Table 2C**
**Soil Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| **General Parameters** | | | | | | |
| Total Organic Carbon (TOC) | SM 5310 B modified-2000 | 100 | 300 | mg/kg | 47-143 | 47-143 |
| Moisture content | SM 2540 G-1997 | 0.5 | 0.5 | % | - | 99-101 |
| pH | SW-846 9045D modified | 0.01 | 0.01 | Std. Units | - | 95-105 |
| **Perfluorinated Compounds** | | | | | | |
| Perfluorobutanoic acid (PFBA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorobutanesulfonate (PFBS) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorodecanoic acid (PFDA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorododecanoic acid (PFDoA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluoroheptanoic acid (PFHpA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorohexanoic acid (PFHxA) | EPA 537 Version 1.1 Modified^ | 0.1 | 0.4 | ng/g | 70-130 | 70-130 |
| Perfluorohexanesulfonate (PFHxS) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorononanoic acid (PFNA) | EPA 537 Version 1.1 Modified^ | 0.1 | 0.4 | ng/g | 70-130 | 70-130 |
| Perfluorooctanoic acid (PFOA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluoro-octanesulfonate (PFOS) | EPA 537 Version 1.1 Modified^ | 0.3 | 0.9 | ng/g | 70-130 | 70-130 |
| Perfluoropentanoic acid (PFPA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorotetradecanoic acid (PFTA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluorotridecanoic acid (PFTriA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| Perfluoroundecanoic acid (PFUnA) | EPA 537 Version 1.1 Modified^ | 0.2 | 0.6 | ng/g | 70-130 | 70-130 |
| **PCB Homologues** | | | | | | |
| Decachlorobiphenyls | EPA 680 November 1985 | 0.5 | 17 | ug/kg | 60-140 | 70-130 |
| Dichlorobiphenyls | EPA 680 November 1985 | 0.2 | 3.3 | ug/kg | 60-140 | 19-126 |
| Heptachlorobiphenyls | EPA 680 November 1985 | 0.5 | 10 | ug/kg | 60-140 | 70-130 |
| Hexachlorobiphenyls | EPA 680 November 1985 | 0.4 | 6.7 | ug/kg | 60-140 | 70-130 |
| Monochlorobiphenyls | EPA 680 November 1985 | 0.3 | 3.3 | ug/kg | 60-140 | 30-95 |
| Nonachlorobiphenyls | EPA 680 November 1985 | 0.5 | 17 | ug/kg | 60-140 | 70-130 |
| Octachlorobiphenyls | EPA 680 November 1985 | 0.5 | 10 | ug/kg | 60-140 | 70-130 |
| Pentachlorobiphenyls | EPA 680 November 1985 | 0.8 | 6.7 | ug/kg | 60-140 | 49-111 |
| Tetrachlorobiphenyls | EPA 680 November 1985 | 0.4 | 6.7 | ug/kg | 60-140 | 44-100 |
| Total Chlorobiphenyls | EPA 680 November 1985 | 0.2 | 3.3 | ug/kg | 60-140 | - |
| Trichlorobiphenyls | EPA 680 November 1985 | 0.2 | 3.3 | ug/kg | 60-140 | 41-100 |
| **VOCs** | | | | | | |
| 1,1,1-Trichloroethane | SW-846 8260C | 1 | 5 | ug/kg | 61-125 | 61-125 |
| 1,1,2,2-Tetrachloroethane | SW-846 8260C | 1 | 5 | ug/kg | 61-131 | 61-131 |
| 1,1,2-Trichloroethane | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| 1,1-Dichloroethane | SW-846 8260C | 1 | 5 | ug/kg | 77-120 | 77-120 |
| 1,1-Dichloroethene | SW-846 8260C | 1 | 5 | ug/kg | 73-129 | 73-129 |

**Table 2C**
**Soil Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| 1,2,3-Trichlorobenzene | SW-846 8260C | 1 | 5 | ug/kg | 63-128 | 63-128 |
| 1,2,4-Trichlorobenzene | SW-846 8260C | 1 | 5 | ug/kg | 62-127 | 62-127 |
| 1,2-Dibromo-3-chloropropane | SW-846 8260C | 2 | 5 | ug/kg | 47-126 | 47-126 |
| 1,2-Dibromoethane | SW-846 8260C | 1 | 5 | ug/kg | 74-120 | 74-120 |
| 1,2-Dichlorobenzene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| 1,2-Dichloroethane | SW-846 8260C | 1 | 5 | ug/kg | 71-128 | 71-128 |
| 1,2-Dichloropropane | SW-846 8260C | 1 | 5 | ug/kg | 76-120 | 76-120 |
| 1,3-Dichlorobenzene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| 1,4-Dichlorobenzene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| 2-Butanone | SW-846 8260C | 4 | 10 | ug/kg | 49-128 | 49-128 |
| 2-Hexanone | SW-846 8260C | 3 | 10 | ug/kg | 51-131 | 51-131 |
| 4-Methyl-2-pentanone | SW-846 8260C | 3 | 10 | ug/kg | 53-134 | 53-134 |
| Acetone | SW-846 8260C | 7 | 20 | ug/kg | 32-144 | 32-144 |
| Benzene | SW-846 8260C | 0.5 | 5 | ug/kg | 80-120 | 80-120 |
| Bromochloromethane | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| Bromodichloromethane | SW-846 8260C | 1 | 5 | ug/kg | 70-120 | 70-120 |
| Bromoform | SW-846 8260C | 1 | 5 | ug/kg | 54-120 | 54-120 |
| Bromomethane | SW-846 8260C | 2 | 5 | ug/kg | 31-160 | 31-160 |
| Carbon Disulfide | SW-846 8260C | 1 | 5 | ug/kg | 60-128 | 60-128 |
| Carbon Tetrachloride | SW-846 8260C | 1 | 5 | ug/kg | 62-129 | 62-129 |
| Chlorobenzene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| Chloroethane | SW-846 8260C | 2 | 5 | ug/kg | 43-137 | 43-137 |
| Chloroform | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| Chloromethane | SW-846 8260C | 2 | 5 | ug/kg | 56-120 | 56-120 |
| cis-1,2-Dichloroethene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| cis-1,3-Dichloropropene | SW-846 8260C | 1 | 5 | ug/kg | 66-120 | 66-120 |
| Cyclohexane | SW-846 8260C | 1 | 5 | ug/kg | 58-126 | 58-126 |
| Dibromochloromethane | SW-846 8260C | 1 | 5 | ug/kg | 65-120 | 65-120 |
| Dichlorodifluoromethane | SW-846 8260C | 2 | 5 | ug/kg | 10-133 | 10-133 |
| Ethylbenzene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| Freon 113 | SW-846 8260C | 2 | 10 | ug/kg | 59-139 | 59-139 |
| Isopropylbenzene | SW-846 8260C | 1 | 5 | ug/kg | 76-120 | 76-120 |
| m+p-Xylene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| Methyl Acetate | SW-846 8260C | 2 | 5 | ug/kg | 54-146 | 54-146 |
| Methyl Tertiary Butyl Ether | SW-846 8260C | 0.5 | 5 | ug/kg | 66-123 | 66-123 |
| Methylcyclohexane | SW-846 8260C | 1 | 5 | ug/kg | 61-124 | 61-124 |
| Methylene Chloride | SW-846 8260C | 2 | 5 | ug/kg | 76-122 | 76-122 |

**Table 2C**
**Soil Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| o-Xylene | SW-846 8260C | 1 | 5 | ug/kg | 75-120 | 75-120 |
| Styrene | SW-846 8260C | 1 | 5 | ug/kg | 76-120 | 76-120 |
| Tetrachloroethene | SW-846 8260C | 1 | 5 | ug/kg | 73-120 | 73-120 |
| Toluene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| trans-1,2-Dichloroethene | SW-846 8260C | 1 | 5 | ug/kg | 80-125 | 80-125 |
| trans-1,3-Dichloropropene | SW-846 8260C | 1 | 5 | ug/kg | 63-124 | 63-124 |
| Trichloroethene | SW-846 8260C | 1 | 5 | ug/kg | 80-120 | 80-120 |
| Trichlorofluoromethane | SW-846 8260C | 2 | 5 | ug/kg | 47-132 | 47-132 |
| Vinyl Chloride | SW-846 8260C | 1 | 5 | ug/kg | 59-120 | 59-120 |
| **SVOCs** | | | | | | |
| 1,1'-Biphenyl | SW-846 8270D | 17 | 33 | ug/kg | 78-115 | 78-115 |
| 1,2,4,5-Tetrachlorobenzene | SW-846 8270D | 17 | 33 | ug/kg | 76-116 | 76-116 |
| 1,4-Dioxane | SW-846 8270D | 100 | 330 | ug/kg | 40-76 | 40-76 |
| 2,2'-oxybis(1-Chloropropane) | SW-846 8270D | 17 | 33 | ug/kg | 53-121 | 53-121 |
| 2,3,4,6-Tetrachlorophenol | SW-846 8270D | 67 | 170 | ug/kg | 65-123 | 65-123 |
| 2,4,5-Trichlorophenol | SW-846 8270D | 17 | 33 | ug/kg | 79-123 | 79-123 |
| 2,4,6-Trichlorophenol | SW-846 8270D | 17 | 33 | ug/kg | 81-123 | 81-123 |
| 2,4-Dichlorophenol | SW-846 8270D | 17 | 33 | ug/kg | 79-125 | 79-125 |
| 2,4-Dimethylphenol | SW-846 8270D | 17 | 33 | ug/kg | 57-102 | 57-102 |
| 2,4-Dinitrophenol | SW-846 8270D | 300 | 1,000 | ug/kg | 27-136 | 27-136 |
| 2,4-Dinitrotoluene | SW-846 8270D | 67 | 170 | ug/kg | 72-127 | 72-127 |
| 2,6-Dinitrotoluene | SW-846 8270D | 17 | 33 | ug/kg | 80-120 | 80-120 |
| 2-Chloronaphthalene | SW-846 8270D | 7 | 33 | ug/kg | 51-150 | 51-150 |
| 2-Chlorophenol | SW-846 8270D | 17 | 33 | ug/kg | 75-124 | 75-124 |
| 2-Methylnaphthalene | SW-846 8270D | 3 | 17 | ug/kg | 77-116 | 77-116 |
| 2-Methylphenol | SW-846 8270D | 17 | 33 | ug/kg | 74-128 | 74-128 |
| 2-Nitroaniline | SW-846 8270D | 17 | 33 | ug/kg | 75-130 | 75-130 |
| 2-Nitrophenol | SW-846 8270D | 17 | 33 | ug/kg | 77-123 | 77-123 |
| 3,3'-Dichlorobenzidine | SW-846 8270D | 100 | 330 | ug/kg | 20-121 | 20-121 |
| 3-Nitroaniline | SW-846 8270D | 67 | 170 | ug/kg | 60-125 | 60-125 |
| 4,6-Dinitro-2-methylphenol | SW-846 8270D | 170 | 500 | ug/kg | 60-128 | 60-128 |
| 4-Bromophenyl-phenylether | SW-846 8270D | 17 | 33 | ug/kg | 78-122 | 78-122 |
| 4-Chloro-3-methylphenol | SW-846 8270D | 17 | 33 | ug/kg | 70-128 | 70-128 |
| 4-Chloroaniline | SW-846 8270D | 33 | 67 | ug/kg | 10-112 | 10-112 |
| 4-Chlorophenyl-phenylether | SW-846 8270D | 17 | 33 | ug/kg | 73-119 | 73-119 |
| 4-Methylphenol | SW-846 8270D | 17 | 33 | ug/kg | 66-121 | 66-121 |
| 4-Nitroaniline | SW-846 8270D | 67 | 170 | ug/kg | 50-112 | 50-112 |

**Table 2C**
**Soil Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| 4-Nitrophenol | SW-846 8270D | 170 | 500 | ug/kg | 44-131 | 44-131 |
| Acenaphthene | SW-846 8270D | 3 | 17 | ug/kg | 78-119 | 78-119 |
| Acenaphthylene | SW-846 8270D | 3 | 17 | ug/kg | 76-119 | 76-119 |
| Acetophenone | SW-846 8270D | 17 | 33 | ug/kg | 68-115 | 68-115 |
| Anthracene | SW-846 8270D | 3 | 17 | ug/kg | 82-118 | 82-118 |
| Atrazine | SW-846 8270D | 33 | 170 | ug/kg | 58-126 | 58-126 |
| Benzaldehyde | SW-846 8270D | 67 | 170 | ug/kg | 17-129 | 17-129 |
| Benzo(a)anthracene | SW-846 8270D | 3 | 17 | ug/kg | 76-119 | 76-119 |
| Benzo(a)pyrene | SW-846 8270D | 3 | 17 | ug/kg | 78-117 | 78-117 |
| Benzo(b)fluoranthene | SW-846 8270D | 3 | 17 | ug/kg | 74-127 | 74-127 |
| Benzo(g,h,i)perylene | SW-846 8270D | 3 | 17 | ug/kg | 72-118 | 72-118 |
| Benzo(k)fluoranthene | SW-846 8270D | 3 | 17 | ug/kg | 71-123 | 71-123 |
| bis(2-Chloroethoxy)methane | SW-846 8270D | 17 | 33 | ug/kg | 69-122 | 69-122 |
| bis(2-Chloroethyl)ether | SW-846 8270D | 17 | 33 | ug/kg | 68-115 | 68-115 |
| bis(2-Ethylhexyl)phthalate | SW-846 8270D | 67 | 170 | ug/kg | 73-123 | 73-123 |
| Butylbenzylphthalate | SW-846 8270D | 67 | 170 | ug/kg | 75-123 | 75-123 |
| Caprolactam | SW-846 8270D | 33 | 170 | ug/kg | 63-121 | 63-121 |
| Carbazole | SW-846 8270D | 17 | 33 | ug/kg | 74-118 | 74-118 |
| Chrysene | SW-846 8270D | 3 | 17 | ug/kg | 72-121 | 72-121 |
| Di-n-butylphthalate | SW-846 8270D | 67 | 170 | ug/kg | 77-121 | 77-121 |
| Di-n-octylphthalate | SW-846 8270D | 67 | 170 | ug/kg | 76-135 | 76-135 |
| Dibenz(a,h)anthracene | SW-846 8270D | 3 | 17 | ug/kg | 72-129 | 72-129 |
| Dibenzofuran | SW-846 8270D | 17 | 33 | ug/kg | 79-114 | 79-114 |
| Diethylphthalate | SW-846 8270D | 67 | 170 | ug/kg | 74-120 | 74-120 |
| Dimethylphthalate | SW-846 8270D | 67 | 170 | ug/kg | 77-116 | 77-116 |
| Fluoranthene | SW-846 8270D | 3 | 17 | ug/kg | 72-120 | 72-120 |
| Fluorene | SW-846 8270D | 3 | 17 | ug/kg | 75-118 | 75-118 |
| Hexachlorobenzene | SW-846 8270D | 3 | 17 | ug/kg | 73-120 | 73-120 |
| Hexachlorobutadiene | SW-846 8270D | 17 | 33 | ug/kg | 72-120 | 72-120 |
| Hexachlorocyclopentadiene | SW-846 8270D | 170 | 500 | ug/kg | 30-133 | 30-133 |
| Hexachloroethane | SW-846 8270D | 33 | 170 | ug/kg | 69-116 | 69-116 |
| Indeno(1,2,3-cd)pyrene | SW-846 8270D | 3 | 17 | ug/kg | 69-125 | 69-125 |
| Isophorone | SW-846 8270D | 17 | 33 | ug/kg | 65-120 | 65-120 |
| N-Nitroso-di-n-propylamine | SW-846 8270D | 17 | 33 | ug/kg | 60-123 | 60-123 |
| N-Nitrosodiphenylamine | SW-846 8270D | 17 | 33 | ug/kg | 83-118 | 83-118 |
| Naphthalene | SW-846 8270D | 3 | 17 | ug/kg | 75-113 | 75-113 |
| Nitrobenzene | SW-846 8270D | 17 | 33 | ug/kg | 70-122 | 70-122 |

**Table 2C**
**Soil Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| Pentachlorophenol | SW-846 8270D | 33 | 170 | ug/kg | 33-141 | 33-141 |
| Phenanthrene | SW-846 8270D | 3 | 17 | ug/kg | 74-114 | 74-114 |
| Phenol | SW-846 8270D | 17 | 33 | ug/kg | 63-125 | 63-125 |
| Pyrene | SW-846 8270D | 3 | 17 | ug/kg | 74-112 | 74-112 |
| **Pesticides** | | | | | | |
| Aldrin | SW-846 8081B | 0.17 | 0.83 | ug/kg | 60-117 | 60-117 |
| Alpha BHC | SW-846 8081B | 0.17 | 0.83 | ug/kg | 65-124 | 65-124 |
| Alpha Chlordane | SW-846 8081B | 0.17 | 0.83 | ug/kg | 73-131 | 73-131 |
| Beta BHC | SW-846 8081B | 0.3 | 1 | ug/kg | 68-129 | 68-129 |
| Delta BHC | SW-846 8081B | 0.45 | 0.9 | ug/kg | 45-151 | 45-151 |
| Dieldrin | SW-846 8081B | 0.33 | 1.7 | ug/kg | 63-126 | 63-126 |
| Endosulfan I | SW-846 8081B | 0.22 | 0.83 | ug/kg | 62-119 | 62-119 |
| Endosulfan II | SW-846 8081B | 0.33 | 1.7 | ug/kg | 65-126 | 65-126 |
| Endosulfan Sulfate | SW-846 8081B | 0.33 | 1.7 | ug/kg | 71-132 | 71-132 |
| Endrin | SW-846 8081B | 0.34 | 1.7 | ug/kg | 65-125 | 65-125 |
| Endrin Aldehyde | SW-846 8081B | 0.33 | 1.7 | ug/kg | 59-122 | 59-122 |
| Endrin Ketone | SW-846 8081B | 0.6 | 1.8 | ug/kg | 64-121 | 64-121 |
| Gamma BHC - Lindane | SW-846 8081B | 0.17 | 0.83 | ug/kg | 47-140 | 47-140 |
| Gamma Chlordane | SW-846 8081B | 0.25 | 0.83 | ug/kg | 76-134 | 76-134 |
| Heptachlor | SW-846 8081B | 0.17 | 0.83 | ug/kg | 66-118 | 66-118 |
| Heptachlor Epoxide | SW-846 8081B | 0.17 | 0.83 | ug/kg | 74-128 | 74-128 |
| Methoxychlor | SW-846 8081B | 1.7 | 6.7 | ug/kg | 65-131 | 65-131 |
| p,p-DDD | SW-846 8081B | 0.33 | 1.7 | ug/kg | 69-138 | 69-138 |
| p,p-DDE | SW-846 8081B | 0.33 | 1.7 | ug/kg | 68-146 | 68-146 |
| p,p-DDT | SW-846 8081B | 0.36 | 1.7 | ug/kg | 67-135 | 67-135 |
| Toxaphene | SW-846 8081B | 14 | 33 | ug/kg | 70-120 | NA |
| **PCBs** | | | | | | |
| Aroclor-1016 | SW-846 8082A | 3.6 | 17 | ug/kg | 76-121 | 76-121 |
| Aroclor-1221 | SW-846 8082A | 4.6 | 17 | ug/kg | - | NA |
| Aroclor-1232 | SW-846 8082A | 8 | 17 | ug/kg | - | NA |
| Aroclor-1242 | SW-846 8082A | 3.3 | 17 | ug/kg | 70-130 | NA |
| Aroclor-1248 | SW-846 8082A | 3.3 | 17 | ug/kg | - | NA |
| Aroclor-1254 | SW-846 8082A | 3.3 | 17 | ug/kg | 50-130 | 60-130 |
| Aroclor-1260 | SW-846 8082A | 4.9 | 17 | ug/kg | 79-130 | 79-130 |
| Aroclor-1262 | SW-846 8082A | 3.3 | 17 | ug/kg | - | NA |
| Aroclor-1268 | SW-846 8082A | 3.3 | 17 | ug/kg | - | NA |

**Table 2C**
**Soil Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| **Metals** | | | | | | |
| Aluminum | SW-846 6010C | 8.94 | 40 | mg/kg | 75-125 | 80-120 |
| Antimony | SW-846 6020A | 0.0932 | 0.4 | mg/kg | 75-125 | 80-120 |
| Arsenic | SW-846 6020A | 0.128 | 0.8 | mg/kg | 75-125 | 80-120 |
| Barium | SW-846 6020A | 0.182 | 0.8 | mg/kg | 75-125 | 80-120 |
| Beryllium | SW-846 6020A | 0.0105 | 0.2 | mg/kg | 75-125 | 80-120 |
| Cadmium | SW-846 6020A | 0.0344 | 0.2 | mg/kg | 75-125 | 80-120 |
| Calcium | SW-846 6010C | 3.33 | 40 | mg/kg | 75-125 | 80-120 |
| Chromium | SW-846 6020A | 0.174 | 0.8 | mg/kg | 75-125 | 80-120 |
| Cobalt | SW-846 6020A | 0.0312 | 0.2 | mg/kg | 75-125 | 80-120 |
| Copper | SW-846 6020A | 0.107 | 0.8 | mg/kg | 75-125 | 80-120 |
| Iron | SW-846 6010C | 8.05 | 40 | mg/kg | 75-125 | 80-120 |
| Lead | SW-846 6020A | 0.0222 | 0.4 | mg/kg | 75-125 | 80-120 |
| Magnesium | SW-846 6010C | 2.43 | 20 | mg/kg | 75-125 | 80-120 |
| Manganese | SW-846 6010C | 0.083 | 1 | mg/kg | 75-125 | 80-120 |
| Mercury | SW-846 7471B | 0.01 | 0.1 | mg/kg | 80-120 | 80-120 |
| Nickel | SW-846 6020A | 0.199 | 0.8 | mg/kg | 75-125 | 80-120 |
| Potassium | SW-846 6010C | 16.7 | 100 | mg/kg | 75-125 | 80-120 |
| Selenium | SW-846 6020A | 0.1 | 0.8 | mg/kg | 75-125 | 80-120 |
| Silver | SW-846 6020A | 0.0292 | 0.2 | mg/kg | 75-125 | 80-120 |
| Sodium | SW-846 6010C | 16.7 | 200 | mg/kg | 75-125 | 80-120 |
| Thallium | SW-846 6020A | 0.025 | 0.2 | mg/kg | 75-125 | 80-120 |
| Vanadium | SW-846 6020A | 0.0426 | 0.2 | mg/kg | 75-125 | 80-120 |
| Zinc | SW-846 6010C | 0.24 | 4 | mg/kg | 75-125 | 80-120 |

^ Modifications to methods are summarized in Worksheet #23

*Reporting limits and statistical QC windows are evaluated annually and are subject to change.*

MDL - Method Detection Limit

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

**Table 2D**
**Wipe Parameters and Limits**
**Saint-Gobain Performance Plastics**
**Bennington, VT QAPP Revision 1**

| Parameter | Method | MDL | LOQ | Units | MS/MSD Limits | LCS/LCSD Limits |
|---|---|---|---|---|---|---|
| **Perfluorinated Compounds** | | | | | | |
| Perfluorobutanoic acid (PFBA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluorobutanesulfonate (PFBS) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluoropentanoic acid (PFPA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluorohexanoic acid (PFHxA) | EPA 537 Version 1.1 Modified^ | 1 | 4 | ng | 70-130 | 70-130 |
| Perfluorohexanesulfonate (PFHxS) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluoroheptanoic acid (PFHpA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluorooctanoic acid (PFOA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluoro-octanesulfonate (PFOS) | EPA 537 Version 1.1 Modified^ | 3 | 9 | ng | 70-130 | 70-130 |
| Perfluorononanoic acid (PFNA) | EPA 537 Version 1.1 Modified^ | 1 | 4 | ng | 70-130 | 70-130 |
| Perfluorodecanoic acid (PFDA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluoroundecanoic acid (PFUnA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluorododecanoic acid (PFDoA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluorotridecanoic acid (PFTriA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |
| Perfluorotetradecanoic acid (PFTA) | EPA 537 Version 1.1 Modified^ | 2 | 6 | ng | 70-130 | 70-130 |

^ Modifications to methods are summarized in Worksheet #23

*Reporting limits and statistical QC windows are evaluated annually and are subject to change.*

MDL - Method Detection Limit

LOQ - Limit of Quantitation

MS - Matrix Spike

MSD - Matrix Spike Duplicate

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

# 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 Duanesburg 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, CEI, CES**
*Managing Geologist/Principal*

**Education:**
Bachelor of Arts, Geological Science, SUNY Potsdam, Potsdam, NY

**Professional Background:**
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 23 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

**KARMA HUGHES, PG**
**Vice President, Senior Geologist**

## Experience

Karma Hughes has 20 years of experience on projects assessing site geology and contaminant migration and evaluating groundwater, surface water, sediment, and soil quality. Her project management experience includes:

- Serving as project manager for investigation and remediation activities at multiple crude-oil pipeline releases, including an approximately 100,000 gallon release and an approximately 800,000 gallon release (both to wetland areas). Project tasks included delineating the extent of impacts; directing excavation activities; analytical sampling to verify response activities; coordinating soil, waste, and water management, as well as disposal and treatment; and other associated response and reporting activities. Work for pipeline clients has included coordinating multiple concurrent soils-management investigations at a refinery, terminals, and pump stations, as well as along hundreds of miles of crude-oil pipelines.
- Serving as project manager for the investigation and remediation of jet-fuel releases at international airports and airport tank farms. Responsibilities include managing work activities at active airports, preparing leak-detection and prevention plans, and assisting with negotiations between a broad group of stakeholders (e.g., the airport owner, fuel committee, airline tenants, fuel-operations company, and regulators).
- Serving as project manager for investigation, groundwater modeling, product recovery, and evaluation of remedial options at a former manufactured gas plant (MGP) located at an active university campus in Michigan.
- Serving in a multi-year, on-site environmental-management-compliance role at a major crude oil pipeline company and assisting with the development and implementation of environmental management systems required to achieve full compliance with local, state, and federal regulations, as well as company standards and guidelines.

Karma's fieldwork experience includes:

- Evaluating airport fueling systems and assessing compliance against ATA guidance, BMPs, and state, local, and federal permits.
- Characterizing subsurface deposits from Geoprobe, split-spoon, and rotary sonic samples.
- Directing the installation of monitoring wells, soil vapor-extraction wells, and product recovery wells.
- Sampling soil, groundwater, lake and river sediment, and surface water using methods, including hand auger, drive-point sampler, and sediment corer.

Karma graduated from a research-based college program with experience in:

- Characterizing modern glacial processes at active glaciers in Canada and Iceland.
- Mapping, describing, and sampling geologic materials during fieldwork in Minnesota, South Dakota, Wisconsin, Wyoming, Canada, and Iceland.

- Conducting a self-directed field research project on the former basin of southwestern Minnesota's Glacial Lake Benson.

**Education** BS, Geology, University of Wisconsin – Madison, 1996

**Registration** Professional Geologist: Minnesota

**Publications/ Presentations**

Rittenour, T.M., K.L. Geiger, and J.F.P. Cotter. 1998. "Glacial Lake Benson, West-Central Minnesota." In *Contributions to Quaternary Studies in Minnesota: Minnesota Geological Survey*, edited C.J. Patterson and H.E. Wright, Jr., 97-102.

"Glacial Lake Benson, West-Central Minnesota." Presented at the 1996 North-Central Section GSA meeting in Ames, Iowa.

## Experience

Jonathon has nine years of experience and specializes in hydrogeologic and hydrogeochemical data acquisition, processing, and analysis; hydrogeologic field methods; and groundwater-flow and contaminant-transport modeling. He is experienced with a number of groundwater modeling and calibration codes (MODFLOW, FEFLOW, MODFLOW-SURFACT, MT3DMS, SEAWAT, RT3D, Groundwater Vistas, PEST, HYDRUS, TimML, and TTim), as well as AQTESOLV, Python, and the Amazon EC2 cloud computing service. Jonathon's work experience includes:

- Evaluating site data and refining the hydrogeologic conceptual model for an active landfill site prior to remedial system design. Determined additional locations for investigation to reduce uncertainty in groundwater flow paths between the landfill and nearby surface water receptors.
- Reviewing hydrogeologic data submittals and requests to use offsite soils for daily cover for an active landfill on behalf of the regulating city. Data quality issues were identified and collaboratively resolved, improving the analysis of the extent, stability, and natural attenuation of a leachate plume containing volatile organic compounds and perfluorochemicals.
- Developing a regional-scale groundwater flow model to assist in site water balance assessments and design of lined facilities for tailings placement and groundwater interception systems for a mining client in Wyoming. Coordinated semiannual data collection, performed data analyses, and prepared summary reports for compliance monitoring.
- Refining and recalibrating an existing numerical model of groundwater flow and contaminant transport at a former manufactured gas plant (MGP) site to guide pump-and-treat remedial actions, quantify contaminant mass flux to an adjacent surface-water body, and evaluate feasibility of monitored natural attenuation as a long-term remedial action.
- Developing numerical models of variable-density flow in FEFLOW and SEAWAT to evaluate the effects of near-surface aquitard excavation on brine migration beneath a proposed brine pond for a mine client in Saskatchewan.
- Writing Python code to process very large, high-frequency datasets with tens of millions of data records. These data are collected as part of wind-turbine structural-health studies to evaluate turbine-foundation condition.
- Developing and calibrating a groundwater flow model of a perched bedrock aquifer system. The model was used to guide design of a groundwater interception system. Performed and analyzed pumping and slug tests to characterize perched aquifer hydraulic properties and evaluate the hydraulic connection between the perched aquifer and wetlands in the study area.
- Collaborating in the development, calibration, and predictive analysis of a local-scale groundwater flow model for a groundwater analysis project in East Bethel, Minnesota, for the Metropolitan Council. Developed new methods to incorporate detailed stratigraphy models into the hydraulic conductivity fields of the groundwater model.

- Leading the development and calibration of a local-scale groundwater flow model used to evaluate the effects of proposed frac-sand mine operations on nearby residential wells, wetlands, and surface-water bodies. Communicated model results and site hydrogeology to state, county, and local government agencies.
- Designing a numerical model of variably saturated flow and reactive contaminant transport to assess migration of perfluorochemicals through a thick vadose zone.
- Designing a numerical model of groundwater flow and reactive contaminant transport to achieve closure of a former industrial site with historic chlorinated-solvent contamination.
- Designing, performing, and analyzing more than 100 slug tests and single-well pumping tests to characterize near-shore aquifer hydraulic properties for calculations of contaminant mass flux from a site adjacent to one of the Great Lakes.

**Education**

MS, Geology and Geophysics (emphasis: hydrogeology), University of Wisconsin-Madison, 2008

MS, Water Resources Management, University of Wisconsin-Madison, 2008

BS, Environmental Science and Geology, Iowa State University, 2005

**Registration**

Professional Geologist: Minnesota, Wyoming

**Publications**

Dahlstrom, D.J., and J.T.V. Carter. "Inverse Modeling with PEST++/GENIE." Groundwater 51.2 (2013): 162-167.

Carter, J.T., and M.B. Gotkowitz. "Depth to Bedrock Map of Iowa County, Wisconsin." Wisconsin Geological and Natural History Survey Open File Report 2011-04, 1 plate.

Carter, J.T.V., M.B. Gotkowitz, and M.P. Anderson. "Field Verification of Stable Perched Groundwater in Layered Bedrock Uplands." Ground Water 49.3 (2011): 383-392.

Gotkowitz, M. and J. Carter. "Groundwater Flow Model for the Geneva Lake Area, Walworth County, Wisconsin." Wisconsin Geological and Natural History Survey Open File Report 2009-02. 2009. 24.

Christianson, E.G., D.J. Dahlstrom, D.J., and J.T.V. Carter "Incorporating Detailed Hydrostratigraphic Information in Groundwater Flow Models Using the HUF Methodology." Proceedings of the Conference MODFLOW and More 2011: Integrated Hydrologic Modeling. Golden, CO: International Groundwater Modeling Center, Colorado School of Mines, 2011. 241-244.

Dahlstrom, D.J., E.G. Christianson, and J.T.V. Carter. "Heuristic Constraints for Inverse Groundwater Flow Models." Proceedings of the Conference MODFLOW and More 2011: Integrated Hydrologic Modeling. Golden, CO: International Groundwater Modeling Center, Colorado School of Mines: Golden, Colorado. 2011. 378-382.

Carter, J.T.V., M.N. Fienen, and D.J. Dahlstrom. "Automated Launching of Remote Processors for Highly Parameterized Inverse Modeling on a Heterogeneous System of

Cloud-Based and Local Computers." Proceedings of the Conference MODFLOW and More 2011: Integrated Hydrologic Modeling. Golden, CO: International Groundwater Modeling Center, Colorado School of Mines, 2011. 637-641.

Simpkins, W.W., B.L. Johnson, J.M. Eidem, M.F. Helmke, E.G. Christianson, J.T. Carter, H. Van Iten, and T.B. Parkin. "Holistic Hydrogeology: Elucidating a > 500 Ka Record of Chemical and Physical Interactions in a Quaternary Aquitard/ Aquifer System." Geological Society of America Abstracts with Programs 43.5 (2011): 176.

Carter, J.T., Gotkowitz, M., and M.P. Anderson. "Vertical Hydraulic Connection Between a Perched Carbonate Aquifer and an Underlying Regional Aquifer." Geological Society of America Abstracts with Programs 39. 6 (2007): 515.

Carter, J.T., M. Gotkowitz, and M.P. Anderson. "Enhanced groundwater flow between perched and regional aquifers through cross-connecting wells and effects on groundwater quality" The Future of Wisconsin's Water Resources: Science and Policy. Wisconsin Dells, WI: Wisconsin Section of the American Water Resources Association, 2007. 23.

Gotkowitz, M.B., D.J. Hart, J.T. Carter, and C.P. Dunning. "Estimating groundwater use in urban and rural areas of Wisconsin." The Future of Wisconsin's Water Resources: Science and Policy. Wisconsin Dells, WI: Wisconsin Section of the American Water Resources Association, 2007. 62.

Carter, J.T., W.W. Simpkins, M.L. Thompson, and T.B. Parkin. "Phosphorus geochemistry in groundwater in the Clear Lake watershed, north-central Iowa." Geological Society of America Abstracts with Programs 37.5 (2005): 34.

**Presentations**

Carter, Jonathon, Julie Sullivan, and Ray Wuolo. "Using a Numerical Model to Assess Groundwater Remediation Effectiveness at a Former Manufactured Gas Plant Site." Midwest Groundwater Conference. Brooklyn Center, MN. 2012.

Carter, Jonathon, Julie Sullivan, and Ray Wuolo. "Using a Numerical Model to Assess Groundwater Remediation Effectiveness at a Former Manufactured Gas Plant Site." MGP 2012 Conference. Chicago, IL. 2012.

Carter, J.T., W.W. Simpkins, M.L. Thompson, and T.B. Parkin. "Phosphorus geochemistry in groundwater in the Clear Lake watershed, north-central Iowa." Agriculture and the Environment Conference. Iowa State University, Ames, IA. 2005.

**MICHAEL DUPAY**
**Senior Environmental Scientist**

**Experience**

Michael Dupay has 11 years of experience and degrees in chemistry and criminal justice from Hamline University in St. Paul, Minnesota. His experience includes evaluating and creating standard operating procedures for an analytical laboratory, using a laboratory-information-management system (LIMS), and presenting findings before small and large groups. Michael's work at Barr includes:

- Providing advanced statistical services, including principle component analysis (PCA), discriminant analysis (DA), and agglomerative hierarchical clustering (AHC).
- Performing bench-scale testing to test project hypotheses on small scales prior to expansion into pilot-scale testing.
- Providing on-site consulting services to Flint Hills Resources' environmental laboratory. Managed laboratory coordination and data evaluation for a refinery-wide mercury mass-balance effort and a mercury-removal pilot project.
- Developing and revising standard operating procedures for data validation.
- Providing quality assurance and quality control (QA/QC) of CLP reports for a complex contaminated waste site in Michigan.
- Developing and designing the QA/QC team intranet webpage which includes tracking of tasks and laboratory QA/QC issues.
- Performing advanced statistical analysis of data to determine likely chemical relationships in complex water systems to determine possible root causes for a client's water-quality issues.
- Performing computer modeling using PHREEQC, a program for speciation, batch-reactions, one-dimensional transport, and inverse geochemical calculations.
- Performing evaluations and assessments of analytical laboratories
- Assisting in the production of quality assurance project plans (QAPPs)
- Providing general QA/QC of data and writing validation reports
- Serving as laboratory liaison for related questions and supply ordering.
- Assisting with an environmental forensic analysis of hydrocarbons.

Prior to joining Barr, Michael served as a student worker in a laboratory environment for the Drug Chemistry section of the Minnesota Bureau of Criminal Apprehension (BCA). His duties for the BCA included:

- Mixing and maintaining reagent supplies.
- Evaluating and developing standard operating procedures.
- Tracking drug standards and evidence (electronic chain of custodies once the evidence was submitted by law enforcement).
- Validating new equipment and procedures used by the drug chemistry laboratory.

**Education**

BA, Chemistry, Hamline University, 2005

BA, Criminal Justice, Hamline University, 2005

Certificate of Forensic Sciences, Hamline University, 2005

**Training**

Essentials of Drinking Water Treatment, University of Wisconsin – Madison, 2017

Basic Assessor Training, ISO/IEC 17025 and NELAC (ASI Course 300), Advanced Systems, Inc., 2010

Contaminant Forensics of Petroleum, Chlorinated Hydrocarbons and Metals (CHEM 405), Northwest Environmental Training Center, 2008

Understanding Water Chemistry for Practical Application, University of Wisconsin – Madison, 2007

# Attachment B

## Certifications

VERMONT

DEPARTMENT OF HEALTH

# *State of Vermont Department of Health*

## *Drinking Water Laboratory Certification*

# *Eurofins Lancaster Laboratories Environmental, LLC*

*Lancaster, Pennsylvania*

***Is certified to perform microbiological, inorganic and organic chemical analyses on drinking water pursuant to the certification letter dated October 28, 2017.***

*Commissioner of Health*

*Laboratory Director*

*Laboratory Certification Officer*

October 28, 2017
*Date certified*

VT – 36037
*Laboratory Number*

October 28, 2018
*Certificate expiration date*

Vermont Drinking Water Certification
Analytical Methods
Issued October 28, 2017 as provided for in 18 VSA 501b
Expiration Date October 28, 2018
This listing is not valid without accompanying Vermont Certificate

# Eurofins Lancaster Laboratories Environmental, LLC

## Lancaster, Pennsylvania

### DRINKING WATER MICRO

Heterotrophic plate count:
SM 9215B
Total Coliform & E. coli:
Chromogenic/fluorogenic substrate test, total coliform
Colilert, SM 9223 B

### DRINKING WATER METALS

Aluminum:
EPA 200.7
Antimony:
EPA 200.8
Arsenic:
EPA 200.8
Barium:
EPA 200.7 EPA 200.8
Beryllium:
EPA 200.7 EPA 200.8
Cadmium:
EPA 200.7 EPA 200.8
Calcium:
EPA 200.7 EPA 200.8
Chromium:
EPA 200.7 EPA 200.8
Copper:
EPA 200.7 EPA 200.8
Hexavalent Chromium:
EPA 218.7
Iron:
EPA 200.7 EPA 200.8
Lead:
EPA 200.8
Magnesium:
EPA 200.7 EPA 200.8
Manganese:
EPA 200.7 EPA 200.8
Mercury:
EPA 245.1
Nickel:
EPA 200.7 EPA 200.8
Selenium:
EPA 200.8
Silver:
EPA 200.7
Sodium:
EPA 200.7 EPA 200.8
Strontium:
EPA 200.7
Thallium:
EPA 200.8
Vanadium:
EPA 200.7
Zinc:
EPA 200.7 EPA 200.8

### DRINKING WATER INORGANIC CONTAMINANTS

Alkalinity:
SM 2320 B
Bromide:
EPA 300.0
Chloride:
EPA 300.0
Chlorine, Free & Total:
SM 4500 Cl F
Color:
EPA 110.2 SM 2120 B
Conductivity (specific Conductance):
SM 2510 B
Corrosivity (Langlier index):
SM 2330 B
Cyanide, Total:
EPA 335.4
Fluoride:
EPA 300.0 SM 4500-F- C
Hardness
SM 2340 C
Nitrate-N:
EPA 300.0 EPA 353.2
Nitrate (Calc.):
EPA 353.2
Nitrate-Nitrite, total:
EPA 353.2
Nitrite-N:
EPA 300.0 EPA 353.2
Orthophosphate:
SM 4500P-E
pH:
EPA 150.1 SM 4500$H^+$ B
Residue, Total Filterable (TDS):
SM 2540 C
Silica:
SM 4500 SiO2C
Sulfate:
EPA 300.0
Surfactants:
SM 5540 C
TOC:
SM 5310 C
Turbidity:
EPA 180.1 SM 2130 B

### DRINKING WATER ACIDS, BASE/NEUTRALS

Benzo(a)pyrene:
EPA 525.2
Di(2-ethylhexyl)adipate:
EPA 525.2
Di(2-ethylhexyl)phthalate:
EPA 525.2
Butyl Benzl Phthalate:
EPA 525.2
Di-n-Butyl Phthalate:
EPA 525.2

**DRINKING WATER ACIDS, BASE/NEUTRALS (cont.)**

Diethyl Phthalate:
EPA 525.2
Dimethyl Phthalate:
EPA 525.2

**DRINKING WATER CARBAMATES**

Aldicarb:
EPA 531.1
Aldicarb Sulfone:
EPA 531.1
Aldicarb Sulfoxide:
EPA 531.1
Carbaryl:
EPA 531.1
Carbofuran:
EPA 531.1
3-Hydrocarbofuran:
EPA 531.1
Methomyl:
EPA 531.1
Vydate (Oxamyl):
EPA 531.1

**DRINKING WATER INSECTICIDES (PESTICIDES)**

Alachlor:
EPA 525.2
Aldrin:
EPA 525.2
Atrazine:
EPA 525.2
Butachlor:
EPA 525.2
Dieldrin:
EPA 525.2
Endrin:
EPA 525.2
Heptachlor:
EPA 525.2
Heptachlor Epoxide:
EPA 525.2
Hexachlorobenzene:
EPA 525.2
Hexachlorocyclopentadiene:
EPA 525.2
Lindane:
EPA 525.2
Methoxychlor:
EPA 525.2
Metolachlor:
EPA 525.2
Metribuzin:
EPA 525.2
Propachlor:
EPA 525.2
Simazine:
EPA 525.2

**INDIVIDUAL DRINKING WATER ORGANIC CONTAMINANTS**

DBCP
EPA 504.1 EPA 524.2
EDB:
EPA 504.1 EPA 524.2
1,2,3 Trichloropropane:
EPA 504.1 EPA 524.2
2,3,7,8-TCDD:
EPA 1613B
Perfluorinated Chemicals (PFOA/PFOS and others):
EPA 537

**DRINKING WATER TRIHALOMETHANES**

Bromodichloromethane:
EPA 524.2
Bromoform:
EPA 524.2
Chlorodibromomethane:
EPA 524.2
Chloroform:
EPA 524.2
Total Trihalomethanes:
EPA 524.2

**DRINKING WATER VOLATILE ORGANICS**

Benzene:
EPA 524.2
Bromobenzene:
EPA 524.2
Bromochloromethane:
EPA 524.2
Bromodichloromethane:
EPA 524.2
Bromoform:
EPA 524.2
Bromomethane:
EPA 524.2
n-Butylbenzene:
EPA 524.2
sec-Butylbenzene:
EPA 524.2
tert-Butylbenzene:
EPA 524.2
Carbon Tetrachloride:
EPA 524.2
Chlorobenzene:
EPA 524.2
Chloroethane:
EPA 524.2
Chloroform:
EPA 524.2
Chloromethane:
EPA 524.2
2-Chlorotoluene:
EPA 524.2
4-Chlorotoluene:
EPA 524.2
Dibromochloromethane:
EPA 524.2
Dibromomethane:
EPA 524.2
1,2-Dichlorobenzene:
EPA 524.2
1,3-Dichlorobenzene:
EPA 524.2
1,4-Dichlorobenzene:
EPA 524.2
Dichlorodifluoromethane:
EPA 524.2
1,1-Dichloroethane:
EPA 524.2
1,2-Dichloroethane:
EPA 524.2
c-1,2-Dichloroethene:
EPA 524.2
t 1,2-Dichloroethylene:
EPA 524.2
1,1-Dichloroethylene:
EPA 524.2
Dichloromethane:
EPA 524.2
1,2-Dichloropropane:
EPA 524.2
1,3-Dichloropropane:
EPA 524.2

**DRINKING WATER VOLATILE ORGANICS (cont.)**

2,2-Dichloropropane:
EPA 524.2
1,1-Dichloropropene:
EPA 524.2
c 1,3-Dichloropropene:
EPA 524.2
t 1,3-Dichloropropene:
EPA 524.2
Ethylbenzene:
EPA 524.2
Hexachlorobutadiene:
EPA 524.2
Isopropylbenzene:
EPA 524.2
4-Isopropyltoluene:
EPA 524.2
Methyl t-Butyl Ether (MTBE):
EPA 524.2
Naphthalene:
EPA 524.2
n-Propylbenzene:
EPA 524.2
Styrene:
EPA 524.2
1,1,1,2-Tetrachloroethane:
EPA 524.2

**DRINKING WATER VOLATILE ORGANICS (cont.)**

1,1,2,2-Tetrachloroethane:
EPA 524.2
Tetrachloroethylene:
EPA 524.2
Toluene:
EPA 524.2
1,2,3-Trichlorobenzene:
EPA 524.2
1,2,4-Trichlorobenzene:
EPA 524.2
1,1,1-Trichloroethane:
EPA 524.2
1,1,2-Trichloroethane:
EPA 524.2
Trichloroethylene:
EPA 524.2
Trichlorofluoromethane:
EPA 524.2
1,2,3-Trichloropropane:
EPA 524.2
1,2,4-Trimethylbenzene:
EPA 524.2
1,3,5-Trimethylbenzene:
EPA 524.2
Total Xylenes:
EPA 524.2
Vinyl Chloride:
EPA 524.2

By:

William G. Mills
Certification Officer
Date signed and effective October 28, 2017

As of October 28, 2017, this list supersedes all previous lists for this certificate number. Vermont certification is based in part upon current Pennsylvania Accreditation Certificate Number 016 for lab 36-00037, expiration date January 31, 2018. New Jersey Laboratory number PA011 Expiration 6/30/2018. Laboratories are certified in Vermont based, in part, upon its Primary Accrediting Authority(ies) drinking water accreditation. Also, loss of drinking water primary accreditation (in part or whole) constitutes loss of certification in Vermont for the same drinking water tests.

VERMONT
DEPARTMENT OF HEALTH

# *State of Vermont Department of Health*
## *Drinking Water Laboratory Certification*

## *Eurofins Eaton Analytical, Inc.*
*South Bend, Indiana*

***Is certified to perform inorganic and organic analyses on drinking water pursuant to the certification letter dated November 15, 2017.***

*Commissioner of Health*

*Laboratory Director*

*Laboratory Certification Officer*

November 15, 2017
*Date certified*

VT - 8775
*Laboratory Number*

November 15, 2018
*Certificate expiration date*

VERMONT

**State of Vermont**
**Department of Health**
Division of Health Surveillance
Public Health Laboratory
Physical address: 359 South Park Drive
Colchester, VT 05446
Mailing Address: P.O. Box 1125
Burlington, VT 05402-1125

[phone] 802-338-4724
[fax] 802-338-4706
[or] 800-660-9997

*Agency of Human Services*

November 15, 2017

Dale Piechocki
Eurofins Eaton Analytical, Inc.
110 South Hill Street
South Bend, IN 46617

Dear Dale Piechocki,

Thank you for applying for drinking water testing certification with the State of Vermont. Please find your laboratory's Drinking Water Laboratory Certification listing enclosed with this letter. Please **review** this document for accuracy and inform us of any possible discrepancies. The listing will be valid until the date on the Analytical Methods attachments [unless your primary accrediting authority changes your accreditation status]. The draft copy of your Vermont Certificate is enclosed. Your final approved Vermont Certificate will be mailed to your laboratory under separate cover.

The Laboratory shall send updated certificates from its primary accrediting authority(ies) within 10 business days of receipt to the Vermont Department of Health.

The granting of certification status is directly related to successful proficiency performance, corrective action, fully implemented quality assurance plan, audits and receipt of fees. The Certification Officer will review these areas prior to granting of certification status. Certification status may change during the calendar year. If you have any suggestions, concerns or questions please call or write to me directly.

Sincerely,

William George Mills,
Program Chief and Laboratory Certification Officer
Vermont State Public Health Laboratory
Phone: (802) 338-4746
Fax: (802) 338-4706
<george.mills@vermont.gov>

cc: Ben Montross, VT Agency of Natural Resources – Drinking Water & Groundwater Protection Division

Attachments

Vermont Drinking Water Certification
Analytical Methods
Issued November 15, 2017 as provided for in 18 VSA 501b
Expiration Date November 15, 2018
This listing is not valid without accompanying Vermont Certificate

# Eurofins Eaton Analytical, Inc.

## South Bend, IN

### DRINKING WATER METALS

Aluminum:
EPA 200.8
Antimony:
EPA 200.8
Arsenic:
EPA 200.8
Barium:
EPA 200.8
Beryllium:
EPA 200.8
Cadmium:
EPA 200.8
Calcium:
EPA 200.7
Chromium:
EPA 200.8
Haxavalent Chromium:
EPA 218.6 EPA 218.7
Copper:
EPA 200.8
Iron:
EPA 200.7
Lead:
EPA 200.8
Magnesium:
EPA 200.7
Manganese:
EPA 200.8
Mercury:
EPA 245.1
Molybdenum:
EPA 200.8
Nickel:
EPA 200.8
Selenium:
EPA 200.8
Silver:
EPA 200.8
Sodium:
EPA 200.7
Thallium:
EPA 200.8
Uranium:
EPA 200.8
Vanadium:
EPA 200.7
Zinc:
EPA 200.8

### DRINKING WATER INORGANIC CONTAMINANTS

Alkalinity:
SM 2320 B
Bromate:
EPA 300.1 EPA 317.0
Bromide:
EPA 300.0
Chlorate:
EPA 300.0

### DRINKING WATER INORGANIC CONTAMINANTS (cont.)

Chloride:
EPA 300.0
Chlorite:
EPA 300.0
Chlorine, Free & Total:
SM 4500 Cl G
Color:
SM 2120 B
Conductivity (specific Conductance):
SM 2510 B
Corrosivity (Langlier index):
SM 2330 B
Cyanide, Total:
EPA 335.4
DOC:
SM 5310C
Fluoride:
EPA 300.0 SM 4500-F- C
Hardness
SM 2340 B
Hardness (Calc.):
EPA 200.7
Nitrate-N:
EPA 300.0 EPA 353.2
Nitrate (Calc.):
EPA 353.2
Nitrate-Nitrite, total:
EPA 353.2
Nitrite-N:
EPA 353.2
Orthophosphate:
SM 4500P-E
pH:
EPA 150.1
Residue, Total Filterable (TDS):
SM 2540 C
Silica:
EPA 200.7
Sulfate:
EPA 300.0
TOC:
SM 5310 C
Turbidity:
EPA 180.1
Perchlorate:
EPA 331.0
UV 254:
SM 5910 B

### DRINKING WATER ACIDS, BASE/NEUTRALS

Benzo(a)pyrene:
EPA 525.2
Di(2-ethylhexyl)adipate:
EPA 525.2
Di(2-ethylhexyl)phthalate:
EPA 525.2
Butyl Benzl Phthalate:
EPA 525.2

## DRINKING WATER ACIDS, BASE/NEUTRALS (cont.)

Di-n-Butyl Phthalate:
EPA 525.2
Diethyl Phthalate:
EPA 525.2
Dimethyl Phthalate:
EPA 525.2

## DRINKING WATER CARBAMATES

Aldicarb:
EPA 531.2
Aldicarb Sulfone:
EPA 531.2
Aldicarb Sulfoxide:
EPA 531.2
Baygon (Propoxur):
EPA 531.2
Carbaryl:
EPA 531.2
Carbofuran:
EPA 531.2
3-Hydrocarbofuran:
EPA 531.2
Methyiocarb:
EPA 531.2
Methomyl:
EPA 531.2
Vydate (Oxamyl):
EPA 531.2

## DRINKING WATER HERBICIDES

Acifluorfen:
EPA 515.3
Bentazon:
EPA 515.3
2,4-D:
EPA 515.3
2,4-DB:
EPA 515.3
Dalapon:
EPA 515.3
DCPA Mono-acid:
EPA 515.3
DCPA Di-acid:
EPA 515.3
Dicamba:
EPA 515.3
3,5-Dichlorobenzoic Acid:
EPA 515.3
Dichloroprop:
EPA 515.3
Dinoseb:
EPA 515.3
Pentachlorophenol:
EPA 515.3
Picloram:
EPA 515.3
2,4,5-T:
EPA 515.3
2,4,5-TP (Silvex):
EPA 515.3

## DRINKING WATER INSECTICIDES (PESTICIDES)

Acetochlor:
EPA 525.2
Alachlor:
EPA 525.2
Aldrin:
EPA 525.2
Atrazine:
EPA 525.2

## DRINKING WATER INSECTICIDES (PESTICIDES) (cont.)

Bromacil :
EPA 525.2
Butachlor:
EPA 525.2
Chlordane:
EPA 505
4,4'-DDD:
EPA 525.2
4,4'-DDE:
EPA 525.2
4.4'DDT:
EPA 525.2
Dieldrin:
EPA 525.2
Endrin:
EPA 525.2
EPTC:
EPA 525.2
Heptachlor:
EPA 525.2
Heptachlor Epoxide:
EPA 525.2
Hexachlorobenzene:
EPA 525.2
Hexachlorocyclopentadiene:
EPA 525.2
Isophorone:
EPA 525.2
Lindane:
EPA 525.2
Methoxychlor:
EPA 525.2
Metolachlor:
EPA 525.2
Metribuzin:
EPA 525.2
Molinate:
EPA 525.2
Propachlor:
EPA 525.2
Simazine:
EPA 525.2
Toxaphene :
EPA 505
Terbacil :
EPA 525.2

## INDIVIDUAL DRINKING WATER ORGANIC CONTAMINANTS

DBCP
EPA 504.1
EDB:
EPA 504.1
Diquat:
EPA 549.2
Endothall:
EPA 548.1
PCBs as Aroclors:
EPA 505
1,2,3 Trichloropropane:
EPA 524.2
Glyphosate:
EPA 547

## DRINKING WATER ORGANIC CONTAMINANTS

Perfluorinated Chemicals (PFOA/PFOS and others):
EPA 537

## DRINKING WATER TRIHALOMETHANES

Bromodichloromethane:
EPA 524.2 EPA 551.1
Bromoform:
EPA 524.2 EPA 551.1
Chlorodibromomethane:
EPA 524.2 EPA 551.1
Chloroform:
EPA 524.2 EPA 551.1
Total Trihalomethanes:
EPA 524.2 EPA 551.1

## DRINKING WATER VOLATILE ORGANICS

Benzene:
EPA 524.2
Bromobenzene:
EPA 524.2
Bromochloromethane:
EPA 524.2
Bromodichloromethane:
EPA 524.2 EPA 551.1
Bromoform:
EPA 524.2 EPA 551.1
Bromomethane:
EPA 524.2
n-Butylbenzene:
EPA 524.2
sec-Butylbenzene:
EPA 524.2
tert-Butylbenzene:
EPA 524.2
Carbon Tetrachloride:
EPA 524.2
Chlorobenzene:
EPA 524.2
Chloroethane:
EPA 524.2
Chloroform:
EPA 524.2 EPA 551.1
Chloromethane:
EPA 524.2
2-Chlorotoluene:
EPA 524.2
4-Chlorotoluene:
EPA 524.2
Dibromochloromethane:
EPA 524.2
Dibromomethane:
EPA 524.2
1,2-Dichlorobenzene:
EPA 524.2
1,3-Dichlorobenzene:
EPA 524.2
1,4-Dichlorobenzene:
EPA 524.2
Dichlorodifluoromethane:
EPA 524.2
1,1-Dichloroethane:
EPA 524.2
1,2-Dichloroethane:
EPA 524.2
c-1,2-Dichloroethene:
EPA 524.2
t 1,2-Dichloroethylene:
EPA 524.2
1,1-Dichloroethylene:
EPA 524.2
Dichloromethane:
EPA 524.2
1,2-Dichloropropane:
EPA 524.2
1,3-Dichloropropane:
EPA 524.2

## DRINKING WATER VOLATILE ORGANICS (cont.)

2,2-Dichloropropane:
EPA 524.2
1,1-Dichloropropene:
EPA 524.2
c 1,3-Dichloropropene:
EPA 524.2
t 1,3-Dichloropropene:
EPA 524.2
Ethylbenzene:
EPA 524.2
Hexachlorobutadiene:
EPA 524.2
Isopropylbenzene:
EPA 524.2
4-Isopropyltoluene:
EPA 524.2
Methyl t-Butyl Ether (MTBE):
EPA 524.2
Naphthalene:
EPA 524.2
n-Propylbenzene:
EPA 524.2
Styrene:
EPA 524.2
1,1,1,2-Tetrachloroethane:
EPA 524.2
1,1,2,2-Tetrachloroethane:
EPA 524.2
Tetrachloroethylene:
EPA 524.2
Toluene:
EPA 524.2
1,2,3-Trichlorobenzene:
EPA 524.2
1,2,4-Trichlorobenzene:
EPA 524.2
1,1,1-Trichloroethane:
EPA 524.2
1,1,2-Trichloroethane:
EPA 524.2
Trichloroethylene:
EPA 524.2
Trichlorofluoromethane:
EPA 524.2
1,2,3-Trichloropropane:
EPA 524.2
1,2,4-Trimethylbenzene:
EPA 524.2
1,3,5-Trimethylbenzene:
EPA 524.2
Total Xylenes:
EPA 524.2
Vinyl Chloride:
EPA 524.2

## DRINKING WATER ORGANIC DISINFECTION BY-PRODUCTS/HALOACETIC ACIDS

Bromoacetic Acid:
EPA 552.2 EPA 552.3
Bromochloracetic Acid:
EPA 552.2 EPA 552.3
Bromodichloroacetric Acid:
EPA 552.2 EPA 552.3
Chloroacetic Acid:
EPA 552.2 EPA 552.3
Dibromoacetic Acid:
EPA 552.2 EPA 552.3

**DRINKING WATER ORGANIC DISINFECTION BY-PRODUCTS/HALOACETIC ACIDS (cont.)**

| | | |
|---|---|---|
| Dichloroacetic Acid: | | |
| | EPA 552.2 | EPA 552.3 |
| Dibromochloracetic Acid: | | |
| | EPA 552.2 | EPA 552.3 |
| Tribromoacetic Acid: | | |
| | EPA 552.2 | EPA 552.3 |
| Trichloroacetic Acid: | | |
| | EPA 552.2 | EPA 552.3 |
| Total Haloacetic Acids: | | |
| | EPA 552.2 | EPA 552.3 |

By:

William G. Mills
Certification Officer
Date signed and effective November 15, 2017

As of November 15, 2017, this list supersedes all previous lists for this certificate number. Vermont certification is based in part upon current Oregon Certificate of Approval Number 4074-005, September 17, 2017 through September 16, 2018. Laboratories are certified in Vermont based, in part, upon its Primary Accrediting Authority(ies) drinking water accreditation. Also, loss of drinking water primary accreditation (in part or whole) constitutes loss of certification in Vermont for the same drinking water tests.

VERMONT

DEPARTMENT OF HEALTH

# *State of Vermont Department of Health*

## *Drinking Water Laboratory Certification*

# *Eurofins Eaton Analytical, Inc. - Monrovia*

*Monrovia, California*

***Is certified to perform organic, inorganic, and radiological analyses on drinking water pursuant to the certification letter dated December 28, 2017***

*Commissioner of Health*

*Laboratory Director*

*Laboratory Certification Officer*

December 28, 2017
*Date certified*

VT - 0114
*Laboratory Number*

December 28, 2018
*Certificate expiration date*

VERMONT

**State of Vermont**
**Department of Health**
Division of Health Surveillance
Public Health Laboratory
Physical address: 359 South Park Drive
Colchester, VT 05446
Mailing Address: P.O. Box 1125
Burlington, VT 05402-1125

[phone] 802-338-4724
[fax] 802-338-4706
[or] 800-660-9997

*Agency of Human Services*

December 28, 2017

Andora Nguyen
Eurofins Eaton Analytical, Inc. - Monrovia
750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016

Dear Andora Nguyen,

Please find your laboratory's Drinking Water Laboratory Certification listing and final approved Vermont Certificate enclosed with this letter. Please **review** the documents for accuracy and inform us of any possible discrepancies. The listing will be valid until the date on the Analytical Methods attachments [unless your primary accrediting authority changes your accreditation status].

The Laboratory shall send updated certificates from its primary accrediting authority(ies) within 10 business days of receipt to the Vermont Department of Health.

The granting of certification status is directly related to successful proficiency performance, corrective action, fully implemented quality assurance plan, audits and receipt of fees. The Certification Officer will review these areas prior to granting of certification status. Certification status may change during the calendar year. If you have any suggestions, concerns or questions please call or write to me directly.

Sincerely,

William George Mills,
Program Chief and Laboratory Certification Officer
Vermont State Public Health Laboratory
Phone: (802) 338-4746
Fax: (802) 338-4706
<george.mills@vermont.gov>

cc: Ben Montross, VT Agency of Natural Resources – Drinking Water & Groundwater Protection Division

Attachments

VT 0114

Vermont Drinking Water Certification
Analytical Methods
Issued December 28, 2017 as provided for in 18 VSA 501b
Expiration Date December 28, 2018
This listing is not valid without accompanying Vermont Certificate

**Eurofins Eaton Analytical, Inc.**
**Monrovia, CA**

## DRINKING WATER METALS

Aluminum:
EPA 200.7 EPA 200.8
Antimony:
EPA 200.8
Arsenic:
EPA 200.8
Barium:
EPA 200.8
Beryllium:
EPA 200.7 EPA 200.8
Boron:
EPA 200.7
Cadmium:
EPA 200.7 EPA 200.8
Calcium:
EPA 200.7
Chromium:
EPA 200.7 EPA 200.8
Hexavalent Chromium:
EPA 218.6 EPA 218.7
Copper:
EPA 200.7 EPA 200.8
Iron:
EPA 200.7
Lead:
EPA 200.8
Magnesium:
EPA 200.7
Manganese:
EPA 200.7 EPA 200.8
Mercury:
EPA 245.1
Molybdenum:
EPA 200.7 EPA 200.8
Nickel:
EPA 200.7 EPA 200.8
Selenium:
EPA 200.8
Silver:
EPA 200.7 EPA 200.8
Sodium:
EPA 200.7
Thallium:
EPA 200.8
Uranium:
EPA 200.8
Vanadium:
EPA 200.7 EPA 200.8
Zinc:
EPA 200.7 EPA 200.8

## DRINKING WATER INORGANIC CONTAMINANTS

Asbestos:
EPA 100.2
Alkalinity:
SM 2320 B
Bromate:
EPA 300.1 EPA 317.0
Bromide:
EPA 300.0 EPA 300.1
Chlorate:
EPA 300.0 EPA 300.1
Chlorite:
EPA 300.0 EPA 300.1
Chloride:
EPA 300.0
Chlorine, Free & Total:
SM 4500Cl G
Chlorine Dioxide:
SM4500-CLO2 D
Color:
SM 2120 B
Conductivity (Specific Conductance):
SM 2510 B
Corrosivity (Langlier Index):
SM 2330 B
Cyanide (Manual Distillation):
SM4500CN-C
Cyanide, Amenable:
SM4500CN-G
Cyanide, Total:
EPA 335.4 SM 4500-CN F
DOC:
SM 5310 C
Fluoride:
EPA 300.0 SM 4500-F-C
Hardness:
SM 2340 B
Hardness (Calc.):
EPA 200.7
Nitrate-N:
EPA 300.0 EPA 353.2
Nitrate-Nitrite, Total:
EPA 300.0 EPA 353.2
Nitrite-N:
EPA 300.0 EPA 353.2
Odor:
SM 2150 B
Orthophospate:
EPA 365.1 SM 4500P-E
pH:
EPA 150.1 SM 4500$H^+$ B

## DRINKING WATER INORGANIC CONTAMINANTS (cont.)

Residue, Total Filterable (TDS):
SM 2540 C
Sulfate:
EPA 300.0
Surfactants:
SM 5540 C
TOC:
SM 5310 B
Turbidity:
EPA 180.1 SM 2130 B
UV 254:
SM 5910B
Perchlorate:
EPA 314.0 EPA 331.0
Silica:
EPA 200.7 SM 4500 SIO2 C
SM 4500 SI D

## DRINKING WATER ACIDS, BASE/NEUTRALS

Benzo(a)pyrene:
EPA 525.2
Di(2-ethylhexyl)adipate:
EPA 525.2
Di(2-ethylhexyl)phthalate:
EPA 525.2
Butyl Benzyl Phthalate:
EPA 525.2
Di-n-Butyl Phthalate:
EPA 525.2
Diethyl Phthalate:
EPA 525.2
Dimethyl Phthalate:
EPA 525.2

## DRINKING WATER CARBAMATES

Aldicarb:
EPA 531.2
Aldicarb Sulfone:
EPA 531.2
Aldicarb Sulfoxide:
EPA 531.2
Carbaryl:
EPA 531.2
Carbofuran:
EPA 531.2
3-Hydroxycarbofuran:
EPA 531.2
Methyiocarb:
EPA 531.2
Methomyl:
EPA 531.2
Vydate (Oxamyl):
EPA 531.2

## DRINKING WATER HERBICIDES

Acifluorfen:
EPA 515.4
Bentazon:
EPA 515.4
2,4-D:
EPA 515.4

## DRINKING WATER HERBICIDES (cont.)

2,4-DB:
EPA 515.4
Dalapon:
EPA 515.4
DCPA Mono-acid:
EPA 515.4
DCPA Di-acid:
EPA 515.4
Dicamba:
EPA 515.4
3,5-Dichlorobenzoic Acid:
EPA 515.4
Dichloroprop:
EPA 515.4
Dinoseb:
EPA 515.4
Pentachlorophenol:
EPA 515.4
Picloram:
EPA 515.4
2,4,5-T:
EPA 515.4
2,4,5-TP (Silvex):
EPA 515.4

## DRINKING WATER INSECTICIDES (PESTICIDES)

Alachlor:
EPA 505 EPA 525.2
Aldrin:
EPA 505 EPA 525.2
Atrazine:
EPA 525.2
Butachlor:
EPA 525.2
Chlordane:
EPA 505 EPA 525.2
4,4'-DDD:
EPA 525.2
4,4'-DDE:
EPA 525.2
4,4'-DDT:
EPA 525.2
Dieldrin:
EPA 505 EPA 525.2
2,4-Dinitrotoluene:
EPA 525.2
2,6-Dinitrotoluene:
EPA 525.2
Endrin:
EPA 505 EPA 525.2
Heptachlor:
EPA 505 EPA 525.2
Heptachlor Epoxide:
EPA 505 EPA 525.2
Hexachlorobenzene:
EPA 525.2
Hexachlorocyclopentadiene:
EPA 525.2
Lindane:
EPA 505 EPA 525.2
Methoxychlor:
EPA 505 EPA 525.2
Metolachlor:
EPA 525.2

## DRINKING WATER INSECTICIDES (PESTICIDES) (cont.)

Metribuzin:
EPA 525.2
Molinate:
EPA 525.2
Pentachlorophenol:
EPA 525.2
Propachlor:
EPA 525.2
Simazine:
EPA 525.2
Toxaphene:
EPA 505

## INDIVIDUAL DRINKING WATER ORGANIC CONTAMINANTS

DBCP
EPA 504.1 EPA 551.1
EDB:
EPA 504.1 EPA 551.1
Diquat:
EPA 549.2
Endothall:
EPA 548.1
PCBs as Aroclors:
EPA 505
1,2,3 Trichloropropane
EPA 504.1 EPA 524.2 EPA 524.3
Glyphosate:
EPA 547
2,3,7,8-TCDD:
EPA 1613 EPA 1613B
1,4-Dioxane:
EPA 522

## DRINKING WATER ORGANIC CONTAMINANTS

Perfluorinated Chemicals (PFOA/PFOS and others):
EPA 537

## DRINKING WATER TRIHALOMETHANES

Bromodichloromethane:
EPA 524.2 EPA 524.3 EPA 551.1
Bromoform:
EPA 524.2 EPA 524.3 EPA 551.1
Chlorodibromomethane:
EPA 524.2 EPA 524.3 EPA 551.1
Chloroform:
EPA 524.2 EPA 524.3 EPA 551.1
Total Trihalomethanes:
EPA 524.2 EPA 524.3 EPA 551.1

## DRINKING WATER VOLATILE ORGANICS

Benzene:
EPA 524.2 EPA 524.3
Bromobenzene:
EPA 524.2 EPA 524.3
Bromochloroacetonitrile:
EPA 551.1
Bromochloromethane:
EPA 524.2 EPA 524.3

## DRINKING WATER VOLATILE ORGANICS (cont.)

Bromodichloromethane:
EPA 524.2 EPA 524.3 EPA 551.1
Bromoform:
EPA 524.2 EPA 524.3 EPA 551.1
Bromomethane:
EPA 524.2 EPA 524.3
n-Butylbenzene:
EPA 524.2 EPA 524.3
sec-Butylbenzene:
EPA 524.2 EPA 524.3
tert-Butylbenzene:
EPA 524.2 EPA 524.3
Carbon Tetrachloride:
EPA 524.2
Chlorobenzene:
EPA 524.2 EPA 524.3
Chloroethane:
EPA 524.2 EPA 524.3
Chloroform:
EPA 524.2 EPA 524.3 EPA 551.1
Chloromethane:
EPA 524.2 EPA 524.3
2-Chlorotoluene:
EPA 524.2 EPA 524.3
4-Chlorotoluene:
EPA 524.2 EPA 524.3
Dibromoacetonitrile:
EPA 551.1
Dibromochloromethane:
EPA 524.2 EPA 524.3 EPA 551.1
Dibromomethane:
EPA 524.2 EPA 524.3
1,1-Dichloro-2-propanone:
EPA 551.1
Dichloroacetonitrile:
EPA 551.1
1,2-Dichlorobenzene:
EPA 524.2 EPA 524.3
1,3-Dichlorobenzene:
EPA 524.2 EPA 524.3
1,4-Dichlorobenzene:
EPA 524.2 EPA 524.3
Dichlorodifluoromethane:
EPA 524.2 EPA 524.3
1,1-Dichloroethane:
EPA 524.2 EPA 524.3
1,2-Dichloroethane:
EPA 524.2 EPA 524.3
c-1,2-Dichloroethene:
EPA 524.2 EPA 524.3
t 1,2-Dichloroethylene:
EPA 524.2 EPA 524.3
1,1-Dichloroethylene:
EPA 524.2 EPA 524.3
Dichloromethane:
EPA 524.2 EPA 524.3
1,2-Dichloropropane:
EPA 524.2 EPA 524.3
1,3-Dichloropropane:
EPA 524.2 EPA 524.3
2,2-Dichloropropane:
EPA 524.2
1,1-Dichloropropene:
EPA 524.2 EPA 524.3

## DRINKING WATER VOLATILE ORGANICS (cont.)

c 1,3-Dichloropropene:
EPA 524.2 EPA 524.3
t 1,3-Dichloropropene:
EPA 524.2 EPA 524.3
Ethylbeneze:
EPA 524.2 EPA 524.3
Hexachlorobutadiene:
EPA 524.2 EPA 524.3
Isopropylbenzene:
EPA 524.2 EPA 524.3
4-Isopropyltoluene
EPA 524.2 EPA 524.3
Methyl t-Butyl Ether (MTBE):
EPA 524.2 EPA 524.3
Naphthalene
EPA 524.2 EPA 524.3
n-Propylbenzene:
EPA 524.2 EPA 524.3
Styrene:
EPA 524.2 EPA 524.3
1,1,1,2-Tetrachloroethane:
EPA 524.2 EPA 524.3
1,1,2,2-Tetrachloroethane:
EPA 524.2 EPA 524.3
Tetrachloroethylene:
EPA 524.2 EPA 524.3
Toluene :
EPA 524.2 EPA 524.3
1,2,3-Trichlorobenzene:
EPA 524.2 EPA 524.3
1,2,4-Trichlorobenzene:
EPA 524.2 EPA 524.3
1,1,1-Trichloroethane:
EPA 524.2 EPA 524.3
1,1,2- Trichloroethane:
EPA 524.2 EPA 524.3
Trichloroethylene:
EPA 524.2 EPA 524.3
Trichlorofluoromethane:
EPA 524.2 EPA 524.3
1,2,3 Trichloropropane:
EPA 524.2 EPA 524.3

## DRINKING WATER VOLATILE ORGANICS (cont.)

1,2,4- Trimethylbenzene:
EPA 524.2 EPA 524.3
1,3,5-Trimethylbenzene:
EPA 524.2 EPA 524.3
Total Xylenes:
EPA 524.2 EPA 524.3
Vinyl Chloride:
EPA 524.2 EPA 534..3

## DRINKING WATER ORGANIC DISINFECTION BY-PRODUCTS/HALOACETIC ACIDS

Bromoacetic Acid:
SM6251B EPA 552.3
Bromochloroacetic Acid:
SM6251B EPA 552.3
Bromodichloroacetic Acid
EPA 552.3
Choracetic Acid:
SM6251B EPA 552.3
Chlorodibromoacetic Acid
EAP 552.3
Dibromacetic Acid:
SM6251B EPA 552.3
Dichloroacetic Acid:
SM6251B EPA 552.3
Tribromoacetic Acid:
EPA 552.3
Trichloracetic Acid:
SM6251B EPA 552.3
Total Haloacetic Acids:
SM6251B EAP 552.3

## DRINKING WATER RADIOLOGICAL CONTAMINANTS

Gross Alpha:
EPA 900.0 SM7110C
Gross Beta:
EPA 900.0
Radium-226:
Georgia Institute of Technology
Radium-228:
Georgia Institute of Technology
Uranium:
EPA 200.8
Radon:
SM 7500 Rn B

By:

William G. Mills
Certification Officer
Date signed and effective December 28, 2017

As of December 28, 2017, this list supersedes all previous lists for this certificate number
Vermont Certification is based in part upon current Oregon Accreditation Certificate of Approval number 4034 as of January 30, 2017 – January 29, 2018. Laboratories are certified in Vermont based, in part, upon its Primary Accrediting Authority(ies) drinking water accreditation. Also, loss of drinking water primary accreditation (in part or whole) constitutes loss of certification in Vermont for the same drinking water tests.

# ATTACHMENT 3

# HEALTH AND SAFETY PLAN

January 2018

# HEALTH & SAFETY PLAN

Saint-Gobain
Performance Plastics
Village of North Bennington &
Town of Bennington
Vermont

Mr. Christopher Angier
SAINT-GOBAIN PERFORMANCE PLASTICS
14 McCaffrey Street
Hoosick Falls, New York 12090

*Prepared by:*

C.T. MALE ASSOCIATES
And
BARR ENGINEERING CO.

*C.T. Male Associates Project No: 16.6131*

**HEALTH & SAFETY PLAN**
**SAINT-GOBAIN PERFORMANCE PLASTICS**
**VERMONT**

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**SAINT-GOBAIN PERFORMANCE PLASTICS**
**VERMONT**

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# 1.0 GENERAL

## 1.1 Overview

The "Site" for the purposes of this Health and Safety Plan (HASP) encompasses the Village of North Bennington, Town of Bennington, and surrounding areas of Vermont. This HASP is a supplement to various Site-specific plan(s) required under the Consent Order and Final Judgment (Consent Order), effective date of October 2, 2017. This HASP has been prepared for use during implementation of investigations at Saint-Gobain Performance Plastics (SGPP) Sites ("the Site") in Vermont. This HASP is written to be in compliance with site work conducted at 29 CFR 1910.120 Hazardous Waste Operations (HAZWOPER) sites.

Site specific training will be required by Saint-Gobain in addition to the procedures presented within this plan including health and safety, emergency communications and procedures, and monitoring.

This HASP is intended to be applicable to activities related to investigations at SGPP Sites in Vermont conducted by C.T. Male Associates Engineering, Surveying, Architecture, & Landscape Architecture D.P.C. (CT Male) and Barr Engineering Co. (Barr).

A designated Office Health and Safety Officer (OHSO) will be responsible for implementing CT Male and Barr's health and safety policies and to ensure field work is in compliance with CT Male, Barr and Saint-Gobain policies. A designated Site Health and Safety Officer (HSO) will be responsible for implementing this HASP during the completion of the field work, and be on-site during work activities. All persons or parties, who enter the Site investigation area including the support zone, decontamination zone or exclusion zone, must review, sign and comply with this HASP. A partial list of individuals authorized to enter the exclusion zone at the Site is presented in Section 13.0 of this HASP. Others may be added to the list as needed. A copy of this HASP will be maintained at the Site throughout the duration of the project. A complete description of the Site investigation work is presented in Site specific work plans.

A brief description of potential investigative scope of work tasks are outlined below:

- Site reconnaissance of exterior and interior areas of the site;
- Boundary and topographic survey of Site and interior building layout;
- Advancing boreholes to collect soil samples, install temporary and permanent monitoring wells in overburden, and install bedrock monitoring wells.
- Drilling and installing new residential water supply wells;
- Developing the newly installed monitoring wells, and purging and collecting groundwater samples for laboratory analysis from overburden and bedrock monitoring wells.
- Collection of surface, shallow and subsurface soil samples for classification and submission for laboratory analyses.
- Monitoring well location and elevation survey.
- Periodic water level gauging of groundwater within the monitoring wells.
- Installation of pressure transducers in monitoring wells and periodic retrieval of the recorded data.
- Collecting POET and residential well samples for laboratory analysis.
- Assessing the Site's sewer and storm water drainage system.
- Collecting sewer and storm water samples from the Site's sewer and storm water drainage system outfall pipes.
- Collecting sediment samples, if present, for subjective and laboratory analysis from the Site's storm water drainage system.
- Performing hydraulic conductivity (slug) testing and water level gauging of monitoring wells.
- Collecting quality control source and field samples for laboratory analysis.
- Collecting wipe samples from hard surface and bulk samples of various building materials.
- Collecting surface water samples for laboratory analysis.
- Installation of soil gas and/or sub-slab gas probes and collection of soil gas and sub-slab gas samples for laboratory analysis.
- Collecting investigation-derived waste samples for laboratory analysis.
- Other unforeseen environmental conditions which may be encountered during investigative work.

## 1.2 Contact Names & Numbers

For this project, the following project contacts have been assigned.

**SGPP CONTACTS:**

SENIOR ENVIRONMENTAL PROJECT MANAGER:

Christopher Angier
Saint-Gobain Performance Plastics
14 McCaffrey Street
Hoosick Falls, New York 12090
518.308.5682 (C)
518.686.6268 (O)

**CONSULTANT CONTACTS:**

| | | |
|---|---|---|
| CONSULTING ENGINEER: | C.T. Male Associates<br>50 Century Hill Drive<br>Latham, NY 12110 | 518.786.7400 |
| | Dan Reilly, Project Principal | 518.786.7625 (O)<br>518. 928.9792 (C) |
| | Kirk Moline, Project Manager | 518.786.7502 (O)<br>518.265.1708 (C) |
| | Kirk Moline, Office Health & Safety Officer | 518.786.7502 (O)<br>518.265.1708 (C) |
| | Jon Dippert, Site HSO | 518.786.7563 (O)<br>518.469.1183 (C) |
| CONSULTING ENGINEER: | Barr Engineering Co.<br>4300 MarketPointe Drive, Suite 200<br>Minneapolis, MN 55435 | 952.832.2600 |
| | Karma Hughes, Project Principal | 952.832.2886 (O) |
| | Jonathon Carter, Project Manager & Office Health & Safety Officer | 952.832.2749 (O) |

**STATE OF VERMONT:**

| | | |
|---|---|---|
| DEPARTMENT OF ENVIRONMENTAL CONSERVATION | State of Vermont<br>Department of Environmental Conservation<br>Water Management and Prevention Division<br>1 National Life Drive – Davis 1<br>Montpelier, VT 05620-3704 | |
| | John Schmeltzer, Project Manager | 802.249.5620 (C) |
| | Richard Spiese, Project Manager | 802.249.5083 (C) |

**EMERGENCY PHONE NUMBERS:**

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| HOSPITAL: | Southwestern Vermont Medical Center<br>100 Hospital Drive<br>Bennington, VT 05201 | 802.442.6361 |
| FIRE DEPARTMENT: | **Emergency**<br>North Bennington Fire Department<br>Prospect Street<br>North Bennington, VT 05257 | **911**<br>802.447.1305 |
| | Town of Bennington Fire Department<br>130 River Street<br>Bennington, Vermont 05201 | 802.442.1030 |
| POLICE: | **Emergency**<br>Bennington Police Department<br>118 South Street<br>Bennington, VT 05201 | **911**<br>802.442.1030 |
| VT State Police | **Emergency**<br>Vermont State Police<br>Shaftsbury Barracks<br>96 Airport Road<br>Shaftsbury, VT 05262 | **911**<br>802.442.5421 |
| REGIONAL POISON CONTROL CENTER: | Northern New England<br>Poison Control Center<br>22 Bramhall Street<br>Portland, ME 04101 | 800.222.1222 |

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| NATIONAL RESPONSE CENTER: | c/o United States Coast Guard (G-OPF)<br>2100 2nd Street, Southwest - Room 2611<br>Washington, DC 20593-0001 | 800.424.8802 |
| VTDEC SPILLS HOTLINE: | 24-Hours | 800.641.5005 |

## 2.0 HEATLH AND SAFETY PERSONNEL

The Office Health and Safety Officer (OHSO) will be responsible for implementing CT Male and Barr's health and safety policies and to ensure field work is in compliance with CT Male, Barr and Saint-Gobain policies.

The Site Health and Safety Officer (SHSO) will be responsible for implementation of the HASP and the delegation of health and safety duties during Site activities. The HSO will coordinate the resolution of safety issues that arise during Site work, or ask the Office Site Health and Safety Office (OSHO) for direction and compliance of the situation. When field operations require only Level D protection, it will not be necessary for the SHSO to be present on-site at all times. When the SHSO is not present on-site, a designee will be authorized to perform the duties of the SHSO, and the designee will be responsible for implementation of the HASP.

The SHSO or designee has authority to stop work upon their determination of an imminent safety hazard, emergency situation or other potentially dangerous situations (e.g. weather conditions). Authorization to resume work will be issued by the OHSO or SHSO.

## 3.0 SITE LOCATION AND DESCRIPTION

The Site is generally centered approximately on the former Chemfab facility located at 1030 Water Street in North Bennington, Vermont. The area near the former Chemfab facility has been identified by the Vermont Department of Environmental Conservation (VTDEC) as an area of interest in the investigation of perfluorooctanoic acid (PFOA) concentrations exceeding regulatory standards in groundwater. The study area also includes the former Chemfab facility on Northside Drive in Bennington, Vermont, and the Bennington Landfill located at 904 Houghton Lane in Bennington, Vermont.

Multiple potential sources of PFOA are within the study area, including the former Chemfab facilities in North Bennington (Water Street) and Bennington (Northside Drive); landfills and solid-waste disposal areas where PFOA has been confirmed in groundwater monitoring wells (e.g., Bennington Landfill, Kocher Drive Landfill); former dump sites where disposal of miscellaneous waste, including waste potentially containing poly and perfluoroalkyl substances (PFAS) may have occurred (e.g., on and near Bennington College property); areas in which sewage sludge from the Bennington Wastewater Treatment Plant (WWTP) was disposed (e.g., Bennington Landfill) and potentially other locations not yet identified. Additionally, there are a number of industries in the area that likely used PFOA or other PFAS in their processes. The mechanisms for PFOA release include the transport, disposal, and leaching of PFOA-containing materials, and air emissions from these industrial facilities.

## 4.0 POTENTIAL SITE CONTAMINANTS

Potential Site contaminants which may be encountered during the investigations are referred to as PFAS, and more specifically Perfluorooctanoic acid (PFOA) and PFOS. PFOA is used in the manufacture of many products including Teflon pans, Teflon tape, pipe dope, new clothing, carpet, upholstery, Tyvek, Goretex clothing and gear, paint additives, stain repellents, and coating on food grade containers.

Hazard assessment of the investigation work task and exposure to potential Site contaminants are outlined in section 5.0 of this HASP.

Safety Data Sheets for the potential Site contaminants are presented in Exhibit 1.

## 5.0 HAZARD ASSESSMENT

### 5.1 General

The hazard assessment, use of specific protective equipment, and monitoring associated with field work tasks during investigations are presented in following subsections. As per Saint-Gobain, CT Male and Barr health and safety programs, all personnel on-site will need to be in Level D (reflective safety vest, eyeglasses, hard hat, safety shoes, and hearing protection), at a minimum, personnel protection while on Site grounds.

For this project, C.T. Male and Barr will be subcontracting portions of the investigation activities. Each subcontractor will be responsible for developing and implementing a Site specific health and safety plan for their activities, for protection of their employees, and use of personal protective equipment. The subcontractor will also be responsible for developing and following their own Respiratory Protection Program, as applicable.

### 5.2 Soil, Sediment and Groundwater Sampling

Surface soil, shallow soil, subsurface soil, sediment and groundwater sampling are planned for the Site. The potential hazards to personnel during this work are dermal contact. Level C protection should be sufficient to protect against dermal contact during handling of soils and water. If organic vapors are present at the action levels described in Section 5.5, on the basis of organic vapor monitoring of the area during the work, it may be necessary to don respiratory protection.

### 5.3 Sewage Sampling

The sampling of sewage from municipal and Site sanitary sewers, floor drains, and sewage sludge from municipal waste water treatment plant are tasks for the Site investigation. The potential hazards to personnel during this work are dermal contact and inhalation. Modified Level D protection should be sufficient to protect against dermal contact and inhalation exposure during handling of sewage samples. When sampling for sewage, a hydrogen sulfide gas meter will be on-site for the potential to analyze the air before entering a space to collect the sample. If organic vapors are present at the action levels described in Section 5.5, on the basis of

organic vapor monitoring of the area during the work, it may be necessary to don respiratory protection.

Personnel will not enter manholes without the appropriate confined space training and the completion of a confined space entry permit. Sampling is expected to be conducted from above the manway and the plane to the confined space area is not expected to be broken.

### 5.4 Subsurface Work

Exploratory soil test borings (including the installation of monitoring wells) are tasks that are planned for site investigations. The potential hazards to personnel during this work are dermal contact. Level D protection should be sufficient to protect against dermal contact during drilling of and/or handling of the subsurface soils and groundwater. If organic vapors are present at the action levels described in Section 5.5, on the basis of organic vapor monitoring of the area during the work, it may be necessary to upgrade to Level C respiratory protection.

### 5.5 Soil Gas and/or Sub-slab Gas Probe Sampling

The installation of soil gas and/or sub-slab soil gas probes and the collection of soil gas samples have the potential hazards to personnel of dermal and inhalation contact. Level D protection should be sufficient to protect against dermal contact during the installation and collection of the soil gas probes and samples. If organic vapors are present at the action levels described in Section 5.5, on the basis of organic vapor monitoring of the area during the work, it may be necessary to upgrade to Level C respiratory protection.

### 5.6 Ambient Air Monitoring during Intrusive Site Activities

During ground intrusive activities, including the completion of test borings and/or ground water well installations, the ambient air in the work area will be monitored with a photoionization detection meter (PID) (MiniRAE 3000 or similar) for volatile organic compounds. The MiniRAE 3000 will have a 10.6 eV bulb and will be used prior to the start of work and periodically as conditions warrant. If a concentration of 10 ppm (sustained for 5 minutes) of total volatile compounds is detected within the work area on the instrument, relative to an isobutylene standard (used to

calibrate the instrument), work will cease immediately and the workers shall shut down equipment and leave the area immediately. The level of personal protective equipment (PPE) protection will be evaluated prior to continuing work. If a PPE upgrade to Level C with respirators is required, it will include: a half face air purifying respirator equipped with combination organic vapor and particulate (HEPA) cartridges for 10-15 ppm exposure levels; and a full-face air purifying respirator for greater than 15 ppm to less than 50 ppm exposure levels, prior to continuing work. If a concentration greater than 50 ppm is encountered, work will cease immediately and the situation will be evaluated prior to continuation of work. Table 1 summarizes the action levels relative to the required respiratory protection.

**Table 1**
**Action Levels & Required Respiratory Protection[1,2]**

| Action Level | Level of PPE | Type of Respiratory Protection |
|---|---|---|
| 0-10 parts per million | Level D | No respiratory protection |
| 10-15 parts per million | Level C | half-face air purifying respirator |
| 15-50 parts per million | Level C | full-face air purifying respirator |
| Greater than 50 | Cease Work | Evaluate work procedures |

1-Facial hair is not permitted while wearing respirators.

2-Workers required to wear a respirator must have a minimum of OSHA 40 Hour training with current medical monitoring and fit test documentation.

## 5.7 Wipe Sampling

Wipe sampling of various surfaces are planned during investigations. Personnel will use man lifts inside of the building to access ceiling and I-beam areas to collect wipe samples, or areas that are not accessible or safe via a ladder. The use of man lifts at the facility will need to be in compliance with Saint-Gobain safety procedures and training on the use of the man lift. The potential hazards to personnel during this work are dermal contact and inhalation hazard. Level D protection should be sufficient to protect against dermal contact during sampling and handling of wipes and wipe samples. If it is determined by the OSHO that worker exposure to dust will be a risk for the sampling, then the employee shall upgrade to Level C and wear a half face or full face air purifying respirator with HEPA filter. If asbestos containing material is suspected then a half or full face air purifying respirator will

be required, and the employee will have proper Vermont certification for an asbestos inspector to take the sample.

### 5.8 Bulk Material Sampling

Bulk material sampling of various building materials are planned for the investigations, typically inside of the building structures. Personnel will use man lifts inside of the building to access ceiling and I-beam areas, or areas that are not accessible or safe via a ladder, for collection of bulk material samples. The use of man lifts at the facility will need to be in compliance with Saint-Gobain safety procedures and training on the use of the man lift. The potential hazards to personnel during this work are dermal contact and inhalation hazard. Level D protection should be sufficient to protect against dermal contact during sampling and handling of the bulk samples. If it is determined by the OSHO that worker exposure to dust will be a risk for the sampling, then the employee shall upgrade to Level C and wear a half face or full face air purifying respirator with HEPA filter. If asbestos containing material is suspected then a half or full face air purifying respirator will be required, and the employee will have proper Vermont certification for an asbestos inspector to take the sample.

### 5.9 Working from Heights

Working from heights (over four feet) would be expected to be encountered when collecting bulk material samples of various building materials (air ducts, stacks, roof materials, wall materials, etc.) planned for the investigations. These samples will typically be collected from inside of the building structures. Personnel may use man lifts, aerial lifts or scissors lifts inside of the building to access ceiling and I-beam areas, or areas that are not accessible or safe via a ladder, for collection of bulk material samples. The use of man lifts, aerial lifts, or scissor lifts at the facility will need to be in compliance OSHA requirements and Saint-Gobain safety procedures and training on the use of the man lift, aerial lift or scissor lift. The potential hazards to personnel during this work are falling from height may cause serious injury. When using a man lift, aerial lift or scissors lift personnel shall be provided the proper PPE such as properly fitted full body harness and lanyard, hard hat, lighting as needed, steel toes boots, safety glasses, and reflective vest. Personnel will be trained on the use of the PPE and the equipment prior to using the lift to collect samples on-site.

Ladders may also be used to collect samples at a Site. The proper use of ladders shall follow OSHA requirements for ladders. Ladders that have a legible tag with load information and have been inspected (in accordance with OSHA) shall be used.

When working from heights either using a ladder or a lift, at a minimum two personnel will be present onsite. One will be engaged on the ladder or lift and the other will be at ground level to monitor the use of the equipment.

### 5.10 Inspection of Roof Decking

If an inspection of the exterior roof decking is needed, prior to accessing the roof, as per Saint-Gobain policies, a structural inspection will be performed by a licensed PE to ensure the roof structural is safe to access. If the roof is deemed safe to access, personnel will need a Saint-Gobain permit for the entry onto the roof which will include safety training and implementation of safety controls.

Inspection of the roof decking may be needed for observation of water flow patterns, drainage points, and material present on the surface of the roof. The potential hazards to personnel during this work are slip, trip, falling, falling from height, and dermal contact of materials. Level D protection should be sufficient to protect against dermal contact of materials on the roof.

To reduce the risk of personnel on the roof, alternative measures to gaining access to the roof such as, use of drones and inspection of bottom interior roof deck, should be implemented.

### 5.11 Confined Space

Only trained and experienced personnel are allowed to enter confined spaces. If there is a confined space that will be entered, CT Male, Barr and Saint-Gobain confined space and safety procedures will need to follow. Confined spaces are defined as an enclosed space which meets the following criteria:

1. It is large enough and so configured that a person can bodily enter;
2. It has limited or restricted means for entry or exit;
3. It is not designated for continuous human occupancy;
4. It has one or more of the following:

a. Contains or has a known potential to contain a hazardous atmosphere;
b. Contains a material with the potential for engulfment of an entrant;
c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inward converging walls, or a floor that slopes downward; and
d. Contains any other recognized serious safety or health hazard.

Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 feet in depth such as pits, manholes, vaults and vessels.

### 5.12 Hazard Identification and Control

The following table presents generalized hazards potentially involved with the tasks to be completed on this project. Table 2 identifies general procedures to follow to prevent or reduce accident, injury or illness. Any worker on-site who identifies a potential hazard must report the condition to the SHSO or designee, and initiate control of the hazardous condition.

**Table 2**
**Potential Hazards and Control**

| Potential Hazard | Control |
|---|---|
| Vehicular and Pedestrian Traffic | 1. Wear safety vest when vehicular hazards exist.<br>2. Use cones, flags, barricades, and caution tape to define work area.<br>3. Equipment must be located in an area that does not present a hazard to by-standers or pedestrians in area.<br>4. Barriers to be used to separate the work areas from both vehicular and pedestrian traffic areas.<br>5. Contact police for high traffic situations. |
| Slip, Trip, and Fall Protection | 1. Assess work area to determine if there is a potential for falling, tripping, or slippery surfaces (water, mud, or condensation). .<br>2. Make sure work area is neat and tools are staged in one general area.<br>3. Wear steel-toe boots (without Gore-Tex or Gore-Tex lining) with adequate tread and always watch where the individual is walking. Carry flashlight when walking in poorly lit areas. |

| Table 2<br>Potential Hazards and Control | |
|---|---|
| **Potential Hazard** | **Control** |
| | 4. When accessing manholes, place cones around manholes as a warning signal.<br>5. Man lifts will be used inside the building to collect bulk material and wipe samples from ceiling and I-beam areas. Proper protection on the man lift will follow Saint-Gobain safety procedures. |
| Inclement Weather | 1. Stop outdoor work during electrical and thunder storms, high winds, blizzard conditions and other extreme weather conditions such as extreme heat or cold temperatures.<br>2. Take cover indoors or in vehicle.<br>3. Listen to local forecasts for warnings about specific weather hazards such as snow storms, tornadoes, hurricanes, and flash floods. |
| Utility Lines Contact | 1. Contact UFPO to have utility lines marked prior to a subsurface investigation, including but not limited to underground excavation, trenching or drilling. UFPO must be contacted at least 72 hours prior to work.<br>2. Possibly conduct on-site utility mark out by a subcontractor, if needed.<br>3. Refer to Site drawings for utility locations.<br>4. Manually dig 3 to 5 feet below grade and 5 feet on each side of utility marked to avoid breaking utility lines. |
| Noise | 1. Wear hearing protection when exposed to noise levels above 85 decibels, which includes equipment such as a drill rig, excavator, jackhammer, boat motor, wood chipper, chainsaw, or other heavy equipment is operating on-site.<br>2. Wear hearing protection whenever you need to raise your voice above normal conversational speech due to a loud noise source; as this much noise indicates the need for protection.<br>3. Hearing protection is required when measured sound exceeds 85 decibels (dB) where employees stand or conduct work. |
| Hand and Power Tools | 1. Ensure cords to tools are not frayed and are properly grounded.<br>2. Ensure guards for power tools are in place (such as portable circular saw) as recommended by the manufacturer<br>3. .Tool cutting edges are kept in proper condition so the tool will operate |

| Table 2<br>Potential Hazards and Control | |
|---|---|
| **Potential Hazard** | **Control** |
| | properly.<br>4. Worn or bent tools are not to be used. Tool handles must be secure.<br>5. When not in use, tools are stored in a dry, secure location.<br>6. Ensure proper PPE use with hand and power tools. Cut or puncture resistant gloves, or work gloves to provide protection may be used. Check with OSHO or SSHO prior to use of the power tools.<br>7. If a generator is used with the power tools, ensure there is proper ventilation for the generator. |
| Electrical Shock | 1. Maintain appropriate distance between heavy equipment and overhead utilities; 20 foot minimum clearance from power lines; and 10 foot minimum clearance from shielded power lines.<br>2. Contact local underground utility locating service prior to penetrating the ground surface. |
| Physical Injury | 1. Wear hard hats, safety glasses, reflective orange safety vest at all times when on-site. Personnel to have hearing protection on them and in use when it is required.<br>2. Maintain visual contact with equipment operators and wear orange safety vest when heavy equipment is operating on-site. Be aware of pedestrians and other vehicle traffic while heavy machinery is operating on-site.<br>3. Avoid loose clothing, long hair, and jewelry when working around rotary equipment.<br>4. Keep hands and feet away from drilling augers, excavation equipment tracks/tires, and other on-site heavy equipment.<br>5. Test emergency shut-off switches on drill rigs and excavation equipment prior to daily use.<br>6. Wear life preserver in boats.<br>7. Do not enter manholes.<br>8. Be aware of openings into manholes and keep area clear of trip hazards.<br>9. Be aware of outside terrain – steep slopes and slip, trip hazards while working.<br>10. Be aware of biological hazards on-site such as insects (bees, mosquitoes, |

| Table 2<br>Potential Hazards and Control | |
|---|---|
| **Potential Hazard** | **Control** |
| | and flies), ticks, spiders, and snakes.<br>11. Be aware of botanical hazards such as poison ivy, poison sumac, and giant hogweed. |
| Back Injury | 1. Use a mechanical lifting device or a lifting aid where appropriate.<br>2. Ensure the route is free of obstructions.<br>3. Bend at the knees and use leg muscles when lifting.<br>4. Use the buddy system if lifting heavy or awkward objects.<br>5. Do not twist or jerk your body when lifting. |
| Heat Stress | 1. Increase water intake while working.<br>2. Avoid excessive alcohol intake the night before working in heat stress situations.<br>3. Increase number of rest breaks as necessary, and rest in a shaded area.<br>4. Watch for signs and symptoms of heat exhaustion, stroke and fatigue.<br>5. Rest in cool, dry areas.<br>6. In the event of heat stress or heat stroke, bring the victim to a cool environment and call 911. |
| Cold Stress | 1. Wear cotton, wool or synthetics (polypropylene) undergarments to absorb perspiration from the body.<br>2. Wear additional layers of light clothing as needed for warmth. The layering effect holds in air, trapping body heat, and some layers could be removed as the temperature rises during the day.<br>3. Pay close attention to body signals and feelings (hypothermia symptoms), especially to the extremities. Correct any problem indications by breaking from the work activity and moving to a rest area to warm up and add additional clothing.<br>4. Increase water intake while working.<br>5. Avoid excessive alcohol intake the night before working in cold conditions.<br>6. Increase the number of rest breaks as necessary, and rest in a warm area.<br>7. In the event of hypothermia or frost bite, bring the victim to a warm environment and call 911. |

| Table 2<br>Potential Hazards and Control | |
|---|---|
| **Potential Hazard** | **Control** |
| Fire Control | 1. Smoking is not allowed on-site.<br>2. Keep flammable liquids in closed containers.<br>3. Isolate flammable and combustible materials from ignition sources.<br>4. Keep fire extinguisher on-site nearby and use only if deemed safe.<br>5. Inform SSHO if a chemical is brought on-site. |
| Media Sampling (water, soil, soil vapor, sediments, sludge, etc.) | 1. Wear appropriate PPE to avoid skin, eye, and inhalation contact with contaminated media (do not wear Tyvek).<br>2. Stand upwind to minimize possible inhalation exposure, especially when opening monitoring wells, sludge and sewage areas, or closed containers/vessels.<br>3. Conduct air monitoring, whenever necessary to determine level of chemical vapors and determine respiratory protection.<br>4. If necessary, employ engineering controls to assist in controlling chemical vapors. |
| Cleaning Equipment | 1. Wear appropriate PPE to avoid skin and eye contact with Alconox or other cleaning materials.<br>2. Stand upwind to minimize possible inhalation exposure.<br>3. Properly dispose of spent chemical cleaning solutions and rinse accordingly. |
| Working from Heights | 1. Assess work area for overhead hazards (e.g., pipes, electrical lines, roof structures, I-beams, fans, lights).<br>2. Man lifts, aerial lift or scissor lift may be used inside the building to collect bulk material and wipe samples from ceiling and I-beam areas. Proper protection on the man lift will follow Saint-Gobain safety procedures.<br>3. When using a man lift or aerial lift, OSHA requirements will be followed. Personnel will be required to wearing a full body harness.<br>4. Personnel that don a full body harness shall have the proper training in the use of that harness and lanyard attached to the harness.<br>5. The use of man lifts, aerial lifts or scissors lifts on-site will require the personnel using the equipment to abide by OSHA and Saint-Gobain Health and Safety procedures and policies. The equipment shall be |

| Table 2<br>Potential Hazards and Control | |
|---|---|
| **Potential Hazard** | **Control** |
| | inspected prior to use. A work plan for the safe use of the equipment may be required by Saint-Gobain prior to approval and use by field personnel.<br>6. Make sure work area is neat and free from obstructions in the path of the man lift, aerial lift or scissor lift. Areas shall be free of tools, objects and be kept in neat order. Tools shall be staged in one general area.<br>7. Wear steel-toe boots (without Gore-Tex or Gore-Tex lining) with adequate tread and carry flashlight when walking in poorly lit areas. |
| Poor Structural Building Condition | 1. Assess building condition prior to entering and note where exit points are at all times. As per Saint-Gobain safety procedures, prior to accessing the roof a structural assessment of the roof will be completed by a licensed PE.<br>2. Be cautious when walking inside the building. Always look for holes in the floors or hanging debris which could cause injury.<br>3. Carry a high power flashlight and use as necessary in low light areas.<br>4. If working in the building, ensure work area is neat and tools are staged in one general area.<br>5. Wear steel-toe boots (without Gore-Tex or Gore-Tex lining) with adequate tread.<br>6. Use the buddy system so someone knows what part of the building individuals are located. |

| | |
|---|---|
| Biological Hazards and Deer Ticks | 1. Site potential hazards may include bites from stray domestic and wild animals, rodents, spiders, bees, ticks, and other insects and arthropods.<br>2. Wear long pants and long sleeve shirts. Pants could be tucked into the top of socks at boot level.<br>3. Wear insect repellant clothing, if available, see SHSO for appropriate clothing.<br>4. Use tick repellent, this will need to be cleared with OSHO or SHSO to ensure that new chemicals are not introduced to the Site.<br>5. Perform personal body checks for the presence of ticks, or insect bites after field work is complete and before the personnel have left the Site.<br>6. Notify the Office Health and Safety Officer immediately if you have been bitten by a tick or notice other insect bites and contact your physician. |
| Note: A first aid kit and fire extinguisher will be located in the C.T. Male company vehicle. | |

Response actions to personal exposure from on-site contaminants include skin contact, eye contact, inhalation, ingestion, and puncture or laceration. The recommended response actions are presented in Section 11.2.

## 6.0 TRAINING

Site specific training of workers and personnel will be conducted and provided by Saint-Gobain and the OSHO or SHSO or designee prior to on-site activity. The training will specifically address the activities, procedures, monitoring and equipment for the Site operations. It will include area and facility layout, hazards, emergency services (police, hospital, fire, etc.), and review of this HASP. Questions by workers, field personnel, etc. will be addressed at this time.

Workers and personnel conducting and/or supervising the project must have attended and successfully completed a 40 Hour Health and Safety Training Course for Hazardous Waste Operations and an annual 8 hour Refresher Course. Workers must take part in an employer medical surveillance program in accordance with OSHA's regulation 29 CFR 1910.120 requirements. Including that the workers have an annual medical physical that is up to date and not past the prior year's annual physical date, prior to the date the employee begins Site work. In addition these results of the annual physical most show that a worker has been cleared by a physician (as per 29 CFR 1910.120) to perform this type of work, and that they are physically able to wear a respirator.

Documentation of training and medical surveillance will be submitted to the OHSO or SHSO or designee prior to the start of any on-site work. A copy of the training certificates shall be inserted into the pocket of this HASP in Appendix A, and/or kept on file at CT Male.

## 7.0 SITE ACCESS

The investigations performed at Sites it is possible that the public or curious bystanders will be present at the time of the work. Therefore, the Site investigation areas and exclusion zones for the investigative tasks will be defined as follows:

- Stakes or tall safety cones (preferably weighted) with caution tape will be used to establish an exclusion zone of 40 foot square area around each test boring location where surface, shallow and subsurface soil samples will be collected and where the monitoring wells will be installed.
- Stakes or tall safety cones (preferably weighted) with caution tape will be used to establish a decontamination zone adjacent to the exclusion zone that has been established. Entry and exit from the exclusion zone will be through the contamination reduction zone.
- Traffic cones will be used to establish a 10 foot square around each manhole sampling location and a flagger will be utilized to direct traffic flow away from the Site investigation area/exclusion zone.
- It should be noted that the size of the containment zones are approximate and due to Site constraints (e.g. roads, fencing, building footprints, etc.) the field health and safety officer can adjust the size of the containments zones as needed based on access and activities within the zone.

Only OSHA trained individuals which are qualified to do the work and have read and signed this Site specific HASP will be allowed within the Site investigation areas and exclusion zone. The SHSO or designee will be responsible for limiting access to unauthorized individuals.

The Contamination Reduction Zone (decontamination area), and Support Zone (clean area, everywhere else) will be established outside the Exclusion Zone, as necessary. The exclusion, contamination reduction, and support zone during investigation work have been identified and designated as follows:

Exclusion Zone - The location of the exclusion zone will be determined in the field prior to the start of work and will vary depending on the work activities conducted. For the most part, the exclusion zone is defined with stakes, caution tape, cones,

and/or company vehicles, if necessary. Only authorized persons with proper training and protective gear will be allowed to enter the exclusion zone.

Contamination Reduction Zone – If applicable, this zone will generally be a 10 foot square area, marked off with stakes with colored flagging, caution tape, cones or equal method if necessary. The location will be determined in the field prior to the start of work and will vary depending on the area(s) the work is being conducted. This zone is where decontamination of personnel and equipment will take place (and decontamination pad), as necessary, on the basis of the work being performed.

Support Zone - Area outside of contamination reduction zone and not including the exclusion zone. Unauthorized or untrained individuals must remain in this zone.

## 8.0 PERSONAL PROTECTION

### 8.1 Level of Protection

Based on evaluation of the potential hazards, the minimum level of protection to be worn by workers during implementation of the SCI activities is defined as Level D protection, and will be controlled by the SHSO or designee.

The minimum level D protective equipment will consist of field clothes, rubber gloves **(NITRILE ONLY)**, hard hats, safety glasses, reflective safety vest, hearing protection, and safety boots (steel-toe without Gore-Tex or Gore-Tex lining). As appropriate, this level of protection may be modified to include protective suits **(NOT TYVEK)**, coveralls, leg chaps, or face shield for additional protection. Level C protective equipment will consist of the items listed for Level D protection with the added protection of half face or full-face, air purifying respirators with combination organic vapor and HEPA particulate cartridge filters. In addition it will include, chemical resistant clothing **(NOT TYVEK)**, inner and outer chemically resistant gloves (i.e. nitrile), and chemical resistant safety overboots.

Level B is not anticipated, but if required, level B protective equipment will consist of the items listed for Level C protection except a self-contained breathing apparatus (SCBA) will be worn dependent on the level of contaminants present in the exclusion zone instead of an air purifying respirator. When Site conditions warrant the need for level B protective equipment, work will cease and the project will be re-evaluated to determine the necessity for employing engineering controls to reduce or eliminate the potential contaminants of concern. If the work reached the need for Level B protection, work will stop and a separate hazard assessment will be completed. CT Male and Barr would anticipate procuring a subcontractor for the task needing to be completed.

Level A is not anticipated at the Site. Level A is the most protective PPE and is selected when the greatest level of skin, respiratory and eye protection is required. If the work reached the need for Level A protection, work will stop and a separate hazard assessment will be completed. CT Male and Barr would anticipate procuring a subcontractor for the task needing to be completed.

## 8.2 Safety Equipment

Basic emergency and first aid equipment will be available at an area within the Support Zone clearly marked and available or within C.T. Male's or Barr's company vehicle. This shall include a first aid kit, eye wash bottles, fire extinguisher, and supply of potable water, soap and towels. Extra PPE will also be kept in the Support Zone or within CT Male's company vehicle. The SHSO or designee shall be equipped with a cellular phone in case of emergencies. If the cellular phone is not available, or is inoperable, a phone in the Saint-Gobain owned facility will be used.

## 9.0 COMMUNICATIONS

The SHSO or designee shall be equipped with a cellular phone in case of emergencies. If the cellular phone is not available, or is inoperable, the facility phone, if available, will be used. The SHSO or designee shall notify the C.T. Male or Barr Project Manager and OSHO as soon as safely possible in the event of an accident, injury or emergency action.

Hand signals for certain work tasks will be employed, as necessary, and the buddy system will be employed during manhole access, Site reconnaissance, Site survey, drilling and sampling activities.

## 10.0 DECONTAMINATION PROCEDURES

### 10.1 Personnel Decontamination Procedures

Decontamination procedures will be carried out by all personnel leaving the Exclusion Zone (except under emergency evacuation). The amount of decontamination performed will be dependent on the level of personal protection currently being worn within the exclusion zone.

1. Do not remove respiratory protection until all steps have been completed.
2. Clean outer protective gloves and outer boots, if worn, with water (preferably with a pressurized washer) over designated wash tubs in the exclusion zone to remove the gross amount of contamination.
3. Deposit equipment used (tools, sampling devices, and containers) at designated drop stations - on plastic drop sheets or in plastic lined containers.
4. Rinse outer boots if worn and gloves with clean water in designated rinse tubs. Remove outer boots if worn and gloves and deposit in designated area to be determined in the field for use the next day or when necessary. If disposable outer boots are worn, remove and discard in designated container.
5. Remove hard hat & safety glasses, rinse with clean water as necessary and deposit in designated area for use the next day or when necessary.
6. Remove protective suit, if worn, and discard in designated container. Remove respirator at this time, if used; wash and rinse with clean water. Organic vapor cartridges, when used, will be replaced daily. Used cartridges will be discarded in the designated waste container. Remove inner gloves and discard in designated container.

### 10.2 Equipment and Sample Containers Decontamination

All decontamination will be completed by personnel in protective gear appropriate for the level of protection determined by the SHSO or designee. Manual sampling equipment that is not disposable, including scoops, hand augers, shovels and core

samplers, etc. which come into contact with the Site's media, will be cleaned with a tap water/detergent wash and a distilled water rinse. The sampling equipment will be decontaminated after each sample is collected at the Contaminant Reduction Zone (Decontamination Station). The sampling equipment wash and rinse water will be captured in plastic pails or tubs and ultimately transferred to labeled DOT 17H approved 55-gallon open top steel drums and staged on-site at a secure location.

Drill rig equipment (i.e., casing, drill rods, bits, core samplers) which comes into contact with the Site's soils will be decontaminated with a high pressure/hot water wash and/or other methods within the Contaminant Reduction Area. The cleaning will be performed prior to commencement of the test boring program and at the completion of each boring location. Equipment decontamination wastes will be transferred to labeled DOT 17H approved 55-gallon open top steel drums and staged on-site at a secure location.

Larger equipment (i.e., drill rig) which comes into contact with the Site's soils will be decontaminated with a high pressure/hot water wash and/or other methods within a decontamination pad. The decontamination procedure will focus on portions of the equipment that has come into contact with the Site's soils such as the tires and tracks. The cleaning will be performed prior to the equipment leaving the Site. Equipment decontamination wastes will be transferred to labeled DOT 17H approved 55-gallon open top steel drums and staged on-site at a secure location.

If a boat is utilized for collection of surface water/sediment samples, portions of the boat that comes into contact with water will be decontaminated at the shoreline by scrubbing with a tap water/detergent wash and a distilled water rinse. The wash/rinse water will be allowed to discharge to the shoreline.

Exterior surfaces of sample containers will be wiped clean with disposable paper towels in the decontamination zone and transferred to a clean cooler for transportation or shipment to the analytical laboratory. Sample identities will be noted and checked off against the chain-of-custody record. The disposable paper towels will be placed in the designated disposal container and disposed of as solid waste.

## 11.0 EMERGENCY RESPONSE PROCEDURES

THE PROJECT EMERGENCY COORDINATOR ARE:

Office Health and Safety Officer (OSHO)
Kirk Moline (CT Male) and Jonathon Carter (Barr)

Site Health and Safety Officer (HSO)
Jonathan Dippert (CT Male)

Project Manager
Kirk Moline (CT Male) and Karma Hughes (Barr)

The following standard emergency procedures will be used by on-site personnel. The Project Manager and OHSO shall be notified of any on-site emergencies and be responsible for assuring that the appropriate procedures are followed.

### 11.1 Personal Injury

Emergency first aid shall be administered on-site as deemed necessary and only by a trained individual, if available at the Site. If a trained individual is not available on-site, decontaminate, if feasible, and transport individual to nearest medical facility (Southwestern Vermont Medical Center). The SHSO will supply medical data sheets to appropriate medical personnel and be responsible for completing the incident report. If the SHSO is injured or controlling the emergency situation, the medical data sheets are available in Appendix B of this Health and Safety Plan. CT Male personnel shall complete a medical data safety sheet prior to working at the Site.

### 11.2 Personal Exposure

The recommended response to worker exposure from contaminants on-site includes the following:

SKIN CONTACT: Use generous amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention, as necessary.

EYE CONTACT: Wash eyes thoroughly with eye wash bottles/ stations on-site or potable tepid water supply provided on-site. Eyes should be rinsed for at least 15 minutes subsequent to chemical contamination. Provide medical attention, as necessary.

INHALATION: Move worker to fresh air and outside of the exclusion zone and/or, if necessary, decontaminate and transport to hospital (Southwestern Vermont Medical Center). If respirator use is implemented at the time of inhalation, worker must not remove respirator until completely away from the exclusion zone.

INGESTION: Decontaminate, if feasible, and transport to hospital (Southwestern Vermont Medical Center).

PUNCTURE WOUND OR
LACERATION: Provide first aid at the Site and if wound needs medical attention, decontaminate, if feasible, and transport to hospital (Southwestern Vermont Medical Center).

If the affected worker is exposed to contaminants on-site and the injury or accident prevents decontamination of the individual, the emergency responders must be notified of this condition and the exposure must be kept to a minimum.

### 11.3 Potential or Actual Fire or Explosion

Immediately evacuate area in the event of potential or actual fire or explosion. Notify the local Fire and Police Departments, and other appropriate emergency response groups, as listed in Section 1.2. Perform off-site decontamination and contain wastes for proper disposal. If a fire or explosion occurs during work external to the facility building, all on-site personnel must meet in the designated area of the Site (established by the SHSO or designee) for an accurate head count. If there is an evacuation of the Site buildings, then CT Male, Barr and subcontractors shall meet at the Sites designated rally point as determined by Saint-Gobain and relayed to CT Male and Barr personnel and subcontractors during the Saint-Gobain Site training.

### 11.4 Equipment Failure

Should there be any equipment failure, breakdown, etc. the Project Manager, OHSO, SHSO shall be contacted immediately. The Project Manager, OHSO or the SHSO will make every effort to replace or repair the equipment in a timely manner.

### 11.5 Spill Response

The SHSO or designee shall initiate a corrective action program with the subcontractors in the event of an accidental release of a hazardous material, suspected hazardous material or petroleum. The SHSO or designee will act as the Emergency Coordinator with the subcontractors for the purposes of: spill prevention; identifying releases; implementing clean up measures; and notification of appropriate personnel.

The corrective action program will be implemented by the SHSO and subcontractor to effectively control and minimize any impact accidental releases may have to the environment.

Effective control measures will include:

- Preliminary assessment of the release.
- Control of the release source.
- Containment of the released material.
- Effective clean-up of the released material.

Potential sources of accidental releases include: hydraulic oil spills or petroleum leaks from heavy equipment; cooling oils (potentially PCB containing) for electrical equipment handling and cleaning; and spills from drums, vats, vessels, and tanks. The SHSO/Emergency Coordinator in conjunction with the subcontractor shall respond to an accidental release in the following manner:

- Identify the character, source, amount and area affected by the release.
- Have subcontractor take all reasonable steps to control the release.
- Notify facility personnel.
- Notify the VTDEC Spill Hotline at 800.641.5005, if required.
- Notify Project Manager and OSHO.

- Contain the release with sorbent material which should include speedi-dry, spill socks and sorbent pads. Use of sorbent material will need to be compatible with the material spilled.
- Prevent the release from entering sensitive receptors (i.e., catch basins and surface water) using the specified sorbent material, sandbags, or storm drain covers.
- Coordinate cleanup of the released material.
- Oversee proper handling and storage of contaminated material for proper disposal.

At no time should personal health or safety be compromised or jeopardized in an attempt to control a release. All health and safety measures as outlined in this HASP should be adhered to.

## 12.0 ADDITIONAL WORK PRACTICES

Workers will be expected to adhere to the established safety practices. Work on the project will be conducted according to established protocol and guidelines for the safety and health of all involved. The following will be adhered to:

- Employ the buddy system when possible, and for those work tasks which require it. Establish and maintain communications.
- Minimize contact with potentially contaminated sewage, sludge, dust, soil and water.
- Employ disposable items when possible to minimize risks during decontamination and possible cross-contamination during sample handling.
- Smoking, eating, or drinking in the exclusion zone or decontamination zone will not be allowed.
- Reduce exposure to heat and other work stress related to wearing personal protective equipment by taking breaks as necessary and drinks plenty of fluids to prevent dehydration.
- Withdrawal from a suspected or actual hazardous situation to reassess procedures is the preferred course of action. Consult the OSHO and Project Manager to complete the reassessment.
- The removal of facial hair (except mustaches – which must be trimmed to not interfere with the proper seal of the respirator) prior to working on-site will be required to allow for a proper respiratory face piece fit.
- The Project Manager, OHSO, and SHSO, and sampling personnel shall maintain records recording daily activities, meetings, facts, incidents, data, etc. relating to the project. These records will remain at the project Site during the full duration of the project so that replacement personnel may add information while maintaining continuity. These daily records will become part of the permanent project file.

## 13.0 AUTHORIZATIONS

Personnel authorized to enter an exclusion zone at the Saint-Gobain Performance Plastics Sites in North Bennington; Bennington County, Vermont while operations are being conducted must be certified by the OHSO or SHSO. Authorization will involve completion of appropriate training courses and review and sign off of this HASP.

Personnel authorized to perform work on-site are as follows. This list is intended to and will be updated to include other C.T. Male and Barr staff who would be working with the Site.

| Personnel | Company | Personnel | Company |
|---|---|---|---|
| Kirk Moline | CT Male | Dan Reilly | CT Male |
| Jeffrey Marx | CT Male | Daniel King | CT Male |
| Dan Achtyl | CT Male | Keegan Donovan | CT Male |
| Steve Bieber | CT Male | Nancy Garry | CT Male |
| Jon Dippert | CT Male | Cliff Bondi | CT Male |
| Brittany Winslow | CT Male | Karma Hughes | Barr |
| Nicole Castagnier | CT Male | Jonathan Carter | Barr |
| Chris Ormsby | CT Male | | |
| | | | |
| | | | |
| | | | |
| | | | |

## 14.0 MEDICAL DATA SHEET

This medical data sheet will be completed by all on-site personnel and will be kept on-site during the duration of the project. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

PROJECT: Investigations and Supplemental Investigations conducted at Saint-Gobain Performance Plastics Sites in North Bennington and Bennington, Vermont.

Name _____ Home Telephone _____

Address _____

Emergency Contact, Name and phone number

_____

Drug or Other Allergies (PPE, food) _____

Particular Sensitivities _____

Do You Wear Contact Lenses _____

Provide a Checklist of Previous Illness or Exposure to Hazardous Chemicals

_____

What Medications Are You Presently Using _____

_____

Do You Have Any Physical or Medical Restrictions _____

_____

Are You Qualified to Wear Respirator (Yes or No) _____ (Provide Fit Test Results)

Name, Address, and Telephone Number of Personal Physician:

_____

_____

_____

## 15.0 FIELD TEAM REVIEW

Each field team member shall sign this section after Site specific training is completed and before being permitted to work on-site.

I have read and understood this Site Specific Health and Safety Plan, and I will comply with the provisions contained therein.

PROJECT: Investigations and Supplemental Investigations
Saint-Gobain Performance Plastics Sites
Bennington and North Bennington
Bennington County, Vermont

| Name: Printed | Signature | Date |
|---|---|---|
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# FIGURE 1

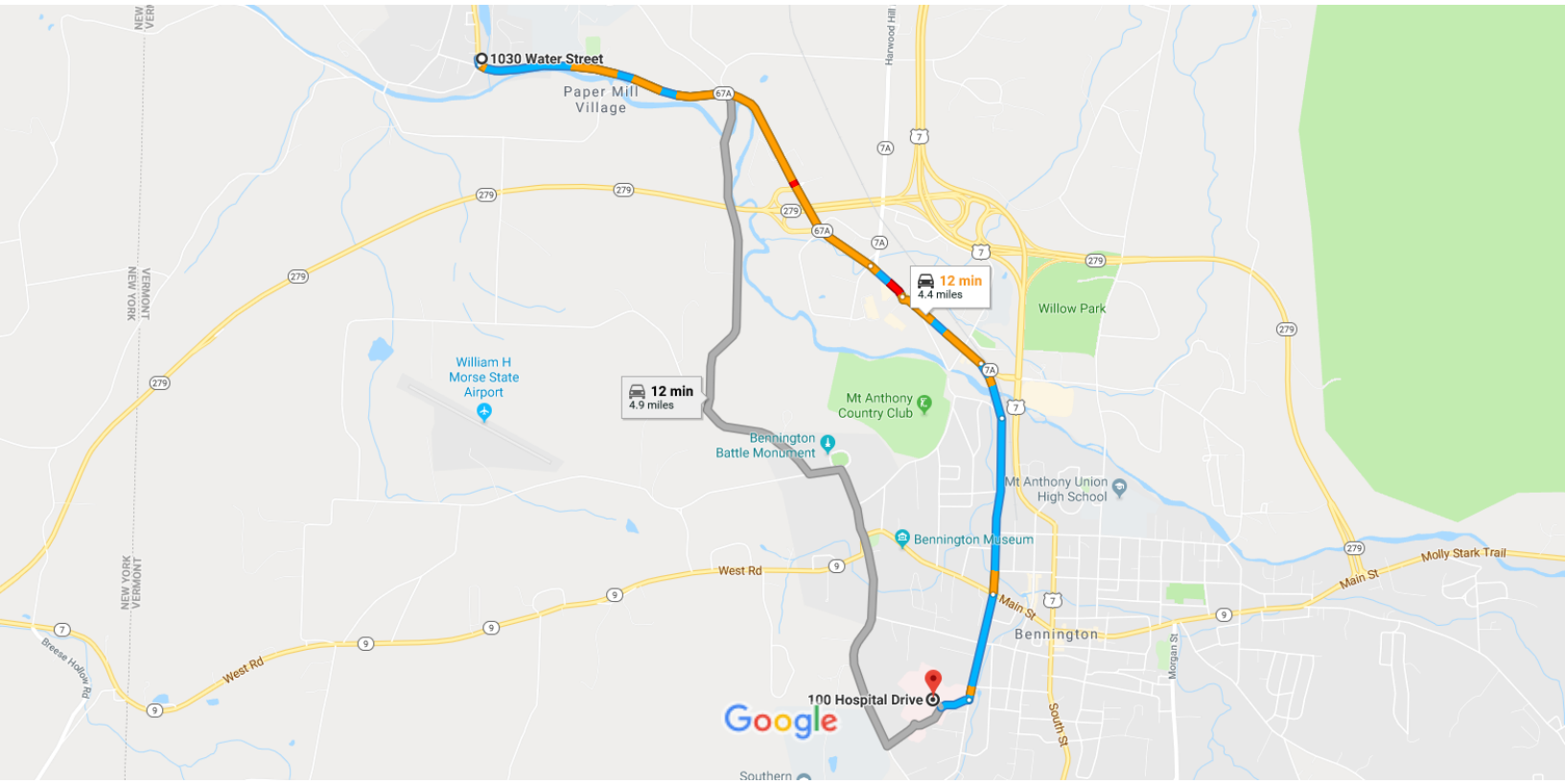
# MAP & DIRECTIONS SHOWING ROUTE TO SOUTHWESTERN VERMONT MEDICAL CENTER

Google Maps

# 1030 Water St, North Bennington, VT 05257 to 100 Hospital Drive, Bennington, VT

Drive 4.4 miles, 12 min

SOUTHWESTERN HOSPITAL MEDICAL CENTER - EMERGENCY ROUTE




## 1030 Water St

North Bennington, VT 05257

### Take VT-67A S/N Bennington Rd to Northside Dr

6 min (2.8 mi)

1. Head south on Water St toward River Rd

138 ft

2. Continue onto VT-67A S/N Bennington Rd

2.1 mi

3. Continue onto VT-7A S

0.2 mi

4. At the traffic circle, take the 2nd exit and stay on VT-7A S

0.5 mi

### Take Benmont Ave and Dewey St to Hospital Dr in Bennington

5 min (1.6 mi)

5. Slight right onto Northside Dr

0.3 mi

6. Continue onto Benmont Ave

0.8 mi

7. Continue onto Dewey St

0.5 mi

8. Turn right onto Hospital Dr

   Destination will be on the right

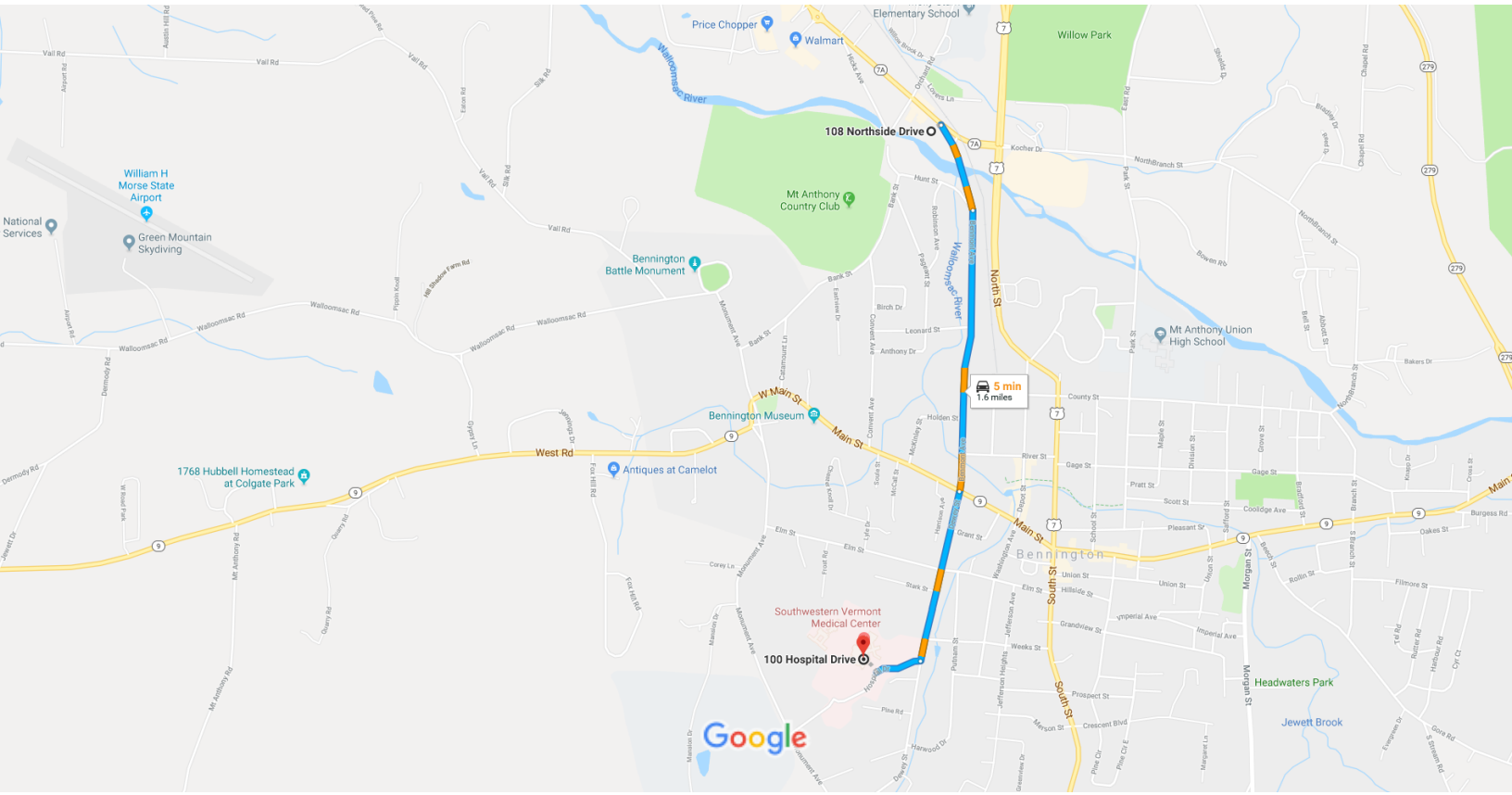
0.1 mi

Google Maps

# 108 Northside Dr, Bennington, VT 05201 to 100 Hospital Drive, Bennington, VT

Drive 1.6 miles, 5 min

SOUTHWESTERN VERMONT MEDICAL CENTER - EMERGENCY ROUTE




Map data ©2018 Google 1000 ft

## 108 Northside Dr

Bennington, VT 05201

1. Head southeast on Northside Dr toward Hunt St — 0.3 mi
2. Continue onto Benmont Ave — 0.8 mi
3. Continue onto Dewey St — 0.5 mi
4. Turn right onto Hospital Dr — 0.1 mi
   Destination will be on the right

## 100 Hospital Dr

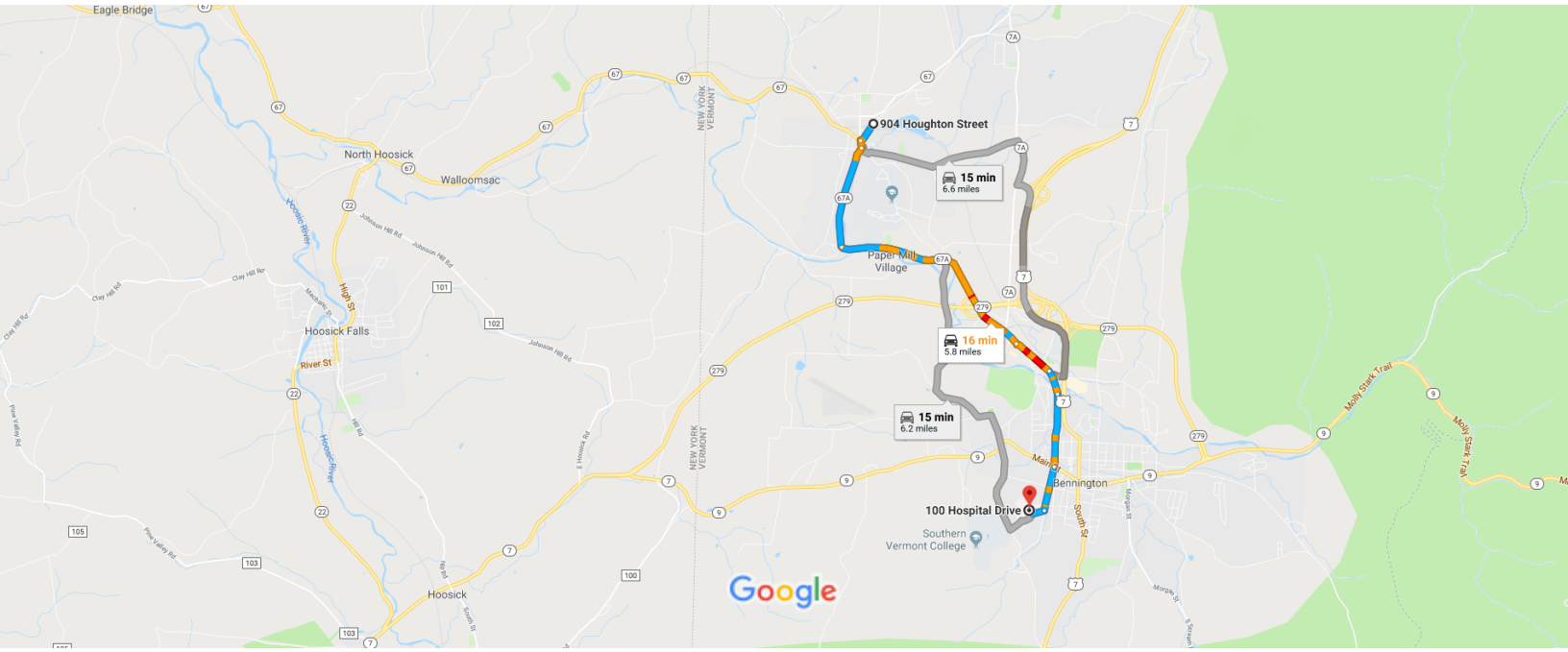
Bennington, VT 05201

Google Maps

# 904 Houghton St to 100 Hospital Drive, Bennington, VT

SOUTHWESTERN VERMONT MEDICAL CENTER - EMERGENCY ROUTE

Drive 5.8 miles, 16 min




Map data ©2018 Google 1 mi

## 904 Houghton St

North Bennington, VT 05257

1. Head southwest on Houghton St/Lake Paran Rd toward Depot St
   Continue to follow Houghton St

44 s (0.2 mi)

**Take Water St and VT-67A S/N Bennington Rd to Northside Dr**

9 min (3.9 mi)

2. Turn left onto Main St

453 ft

3. Main St turns right and becomes Water St

1.1 mi

4. Continue onto VT-67A S/N Bennington Rd

2.1 mi

5. Continue onto VT-7A S

0.2 mi

6. At the traffic circle, take the 2nd exit and stay on VT-7A S

0.5 mi

**Take Benmont Ave and Dewey St to Hospital Dr in Bennington**

5 min (1.6 mi)

7. Slight right onto Northside Dr

0.3 mi

8. Continue onto Benmont Ave

0.8 mi

9. Continue onto Dewey St

0.5 mi

10. Turn right onto Hospital Dr
    Destination will be on the right

0.1 mi

# APPENDIX A

# TRAINING CERTIFICATES

# APPENDIX B

# MEDICAL DATA SHEETS

# EXHIBIT 1

# SAFETY DATA SHEETS

# SAFETY DATA SHEET

Version 4.9
Revision Date 05/24/2016
Print Date 01/08/2018

## 1. PRODUCT AND COMPANY IDENTIFICATION

### 1.1 Product identifiers

Product name : Perfluorooctanoic acid

Product Number : 171468
Brand : Aldrich

CAS-No. : 335-67-1

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

### 1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 4), H332
Serious eye damage (Category 1), H318
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 1B), H360
Effects on or via lactation, H362
Specific target organ toxicity - repeated exposure (Category 1), Liver, H372

For the full text of the H-Statements mentioned in this Section, see Section 16.

### 2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

| | |
|---|---|
| H302 + H332 | Harmful if swallowed or if inhaled |
| H318 | Causes serious eye damage. |
| H351 | Suspected of causing cancer. |
| H360 | May damage fertility or the unborn child. |
| H362 | May cause harm to breast-fed children. |
| H372 | Causes damage to organs (Liver) through prolonged or repeated exposure. |

Precautionary statement(s)

| | |
|---|---|
| P201 | Obtain special instructions before use. |
| P202 | Do not handle until all safety precautions have been read and understood. |
| P260 | Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. |
| P263 | Avoid contact during pregnancy/ while nursing. |
| P264 | Wash skin thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| P301 + P312 + P330 | IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. |
| P304 + P340 + P312 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. |
| P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. |
| P308 + P313 | IF exposed or concerned: Get medical advice/ attention. |
| P405 | Store locked up. |
| P501 | Dispose of contents/ container to an approved waste disposal plant. |

**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS** - none

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substances**

| | | |
|---|---|---|
| Synonyms | : | Pentadecafluorooctanoic acid<br>Perfluorocaprylic acid<br>Perfluorooctanoic acid |
| Formula | : | $C_8HF_{15}O_2$ |
| Molecular weight | : | 414.07 g/mol |
| CAS-No. | : | 335-67-1 |
| EC-No. | : | 206-397-9 |

**Hazardous components**

| Component | Classification | Concentration |
|---|---|---|
| **Pentadecafluorooctanoic acid** Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH) | | |
| | Acute Tox. 4; Eye Dam. 1; Carc. 2; Repr. 1B; Lact. ; STOT RE 1; H302 + H332, H318, H351, H360, H362, H372 | <= 100 % |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 4. FIRST AID MEASURES

**4.1 Description of first aid measures**

**General advice**
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**
Continue rinsing eyes during transport to hospital.Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**4.2 Most important symptoms and effects, both acute and delayed**
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

**4.3 Indication of any immediate medical attention and special treatment needed**
No data available

## 5. FIREFIGHTING MEASURES

**5.1 Extinguishing media**

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**5.2 Special hazards arising from the substance or mixture**
No data available

**5.3 Advice for firefighters**
Wear self-contained breathing apparatus for firefighting if necessary.

**5.4 Further information**
No data available

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

**6.2 Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**6.3 Methods and materials for containment and cleaning up**
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**
For disposal see section 13.

## 7. HANDLING AND STORAGE

**7.1 Precautions for safe handling**
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

**7.2 Conditions for safe storage, including any incompatibilities**
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

**7.3 Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters**

**Components with workplace control parameters**
Contains no substances with occupational exposure limit values.

### 8.2 Exposure controls

**Appropriate engineering controls**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Eye/face protection**
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| a) | Appearance | Form: flakes<br>Colour: colourless |
| b) | Odour | No data available |
| c) | Odour Threshold | No data available |
| d) | pH | 2.6 at 1 g/l |
| e) | Melting point/freezing point | Melting point/range: 55 - 56 °C (131 - 133 °F) - lit. |
| f) | Initial boiling point and boiling range | 189 °C (372 °F) at 981 hPa (736 mmHg) - lit. |
| g) | Flash point | No data available |

| | | |
|---|---|---|
| h) | Evaporation rate | No data available |
| i) | Flammability (solid, gas) | No data available |
| j) | Upper/lower flammability or explosive limits | No data available |
| k) | Vapour pressure | 0.69 hPa (0.52 mmHg) at 25 °C (77 °F) |
| l) | Vapour density | No data available |
| m) | Relative density | 0.900 g/cm3 |
| n) | Water solubility | No data available |
| o) | Partition coefficient: n-octanol/water | No data available |
| p) | Auto-ignition temperature | No data available |
| q) | Decomposition temperature | No data available |
| r) | Viscosity | No data available |
| s) | Explosive properties | No data available |
| t) | Oxidizing properties | No data available |

**9.2 Other safety information**
No data available

## 10. STABILITY AND REACTIVITY

**10.1 Reactivity**
No data available

**10.2 Chemical stability**
Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**
No data available

**10.4 Conditions to avoid**
No data available

**10.5 Incompatible materials**
Bases, Oxidizing agents, Reducing agents

**10.6 Hazardous decomposition products**
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen fluoride
Other decomposition products - No data available
In the event of fire: see section 5

## 11. TOXICOLOGICAL INFORMATION

**11.1 Information on toxicological effects**

**Acute toxicity**
Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Rat - 189 mg/kg

**Skin corrosion/irritation**
No data available

**Serious eye damage/eye irritation**
No data available

**Respiratory or skin sensitisation**
No data available

**Germ cell mutagenicity**

Rat
DNA damage

Rat
DNA damage

**Carcinogenicity**

Suspected human carcinogens

| | |
|---|---|
| IARC: | 2B - Group 2B: Possibly carcinogenic to humans (Pentadecafluorooctanoic acid) |
| NTP: | No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. |
| OSHA: | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. |

**Reproductive toxicity**
Effects on or via lactation

Presumed human reproductive toxicant

No data available

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
Causes damage to organs through prolonged or repeated exposure. - Liver

**Aspiration hazard**
No data available

**Additional Information**
RTECS: RH0781000

Cough, Shortness of breath, Headache, Nausea, Vomiting

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

## 12. ECOLOGICAL INFORMATION

**12.1 Toxicity**
No data available

**12.2 Persistence and degradability**
No data available

**12.3 Bioaccumulative potential**
No data available

**12.4 Mobility in soil**
No data available

**12.5 Results of PBT and vPvB assessment**
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**12.6 Other adverse effects**

No data available

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Product**
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**
Dispose of as unused product.

## 14. TRANSPORT INFORMATION

**DOT (US)**
UN number: 3261 Class: 8 Packing group: III
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. (Pentadecafluorooctanoic acid)
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

**IMDG**
UN number: 3261 Class: 8 Packing group: III EMS-No: F-A, S-B
Proper shipping name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Pentadecafluorooctanoic acid)

**IATA**
UN number: 3261 Class: 8 Packing group: III
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. (Pentadecafluorooctanoic acid)

## 15. REGULATORY INFORMATION

**SARA 302 Components**
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know Components**

| | CAS-No. | Revision Date |
|---|---|---|
| Pentadecafluorooctanoic acid | 335-67-1 | |

**New Jersey Right To Know Components**

| | CAS-No. | Revision Date |
|---|---|---|
| Pentadecafluorooctanoic acid | 335-67-1 | |

**California Prop. 65 Components**
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

## 16. OTHER INFORMATION

**Full text of H-Statements referred to under sections 2 and 3.**

| | |
|---|---|
| Acute Tox. | Acute toxicity |
| Carc. | Carcinogenicity |
| Eye Dam. | Serious eye damage |

| | |
|---|---|
| H302 | Harmful if swallowed. |
| H302 + H332 | Harmful if swallowed or if inhaled |
| H318 | Causes serious eye damage. |
| H332 | Harmful if inhaled. |
| H351 | Suspected of causing cancer. |
| H360 | May damage fertility or the unborn child. |
| H362 | May cause harm to breast-fed children. |
| H372 | Causes damage to organs through prolonged or repeated exposure. |

**HMIS Rating**

| | |
|---|---|
| Health hazard: | 3 |
| Chronic Health Hazard: | * |
| Flammability: | 0 |
| Physical Hazard | 0 |

**NFPA Rating**

| | |
|---|---|
| Health hazard: | 3 |
| Fire Hazard: | 0 |
| Reactivity Hazard: | 0 |

**Further information**


The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

**Preparation Information**

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 05/24/2016 Print Date: 01/08/2018

# Perfluorooctanesulfonic acid

Safety Data Sheet 6164308

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 12/10/2015 Version: 1.0

## SECTION 1: Identification

### 1.1. Identification

| | | |
|---|---|---|
| Product form | : | Substance |
| Substance name | : | Perfluorooctanesulfonic acid |
| CAS No | : | 1763-23-1 |
| Product code | : | 6164-3-08 |
| Formula | : | C8HF17O3S |
| Synonyms | : | 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-Heptadecafluorooctane-1-sulfonic acid |
| Other means of identification | : | MFCD00042454 |

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

| | | |
|---|---|---|
| Use of the substance/mixture | : | Laboratory chemicals<br>Manufacture of substances<br>Scientific research and development |

### 1.3. Details of the supplier of the safety data sheet

SynQuest Laboratories, Inc.
P.O. Box 309
Alachua, FL 32615 - United States of America
T (386) 462-0788 - F (386) 462-7097
info@synquestlabs.com - www.synquestlabs.com

### 1.4. Emergency telephone number

| | | |
|---|---|---|
| Emergency number | : | (844) 523-4086 (3E Company - Account 10069) |

## SECTION 2: Hazard(s) identification

### 2.1. Classification of the substance or mixture

**Classification (GHS-US)**

| | | |
|---|---|---|
| Acute Tox. 4 (Oral) | H302 - | Harmful if swallowed |
| Skin Corr. 1B | H314 - | Causes severe skin burns and eye damage |
| Eye Dam. 1 | H318 - | Causes serious eye damage |
| STOT SE 3 | H335 - | May cause respiratory irritation |

Full text of H-phrases: see section 16

### 2.2. Label elements

**GHS-US labeling**

Hazard pictograms (GHS-US) :

GHS05 GHS07

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :
P260 - Do not breathe dust, mist, spray
P264 - Wash skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P312 - If swallowed: Call a POISON CENTER or doctor/ physician if you feel unwell
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician
P321 - Specific treatment (see supplemental first aid instructions on this label)
P330 - Rinse mouth

P363 - Wash contaminated clothing before reuse
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to an approved waste disposal plant

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Substance type : Mono-constituent

| Name | Product identifier | % | Classification (GHS-US) |
|---|---|---|---|
| Perfluorooctanesulfonic acid<br>(Main constituent) | (CAS No) 1763-23-1 | <= 100 | Acute Tox. 4 (Oral), H302<br>Skin Corr. 1B, H314<br>Eye Dam. 1, H318<br>STOT SE 3, H335 |

Full text of H-phrases: see section 16

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Move the affected personnel away from the contaminated area.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Get immediate medical advice/attention.

First-aid measures after skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Get immediate medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

First-aid measures after ingestion : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get immediate medical advice/attention.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

Symptoms/injuries after inhalation : Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Thermal decomposition generates: Carbon oxides. Hydrogen fluoride. Sulfur oxides.

### 5.3. Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area.

Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Ensure adequate air ventilation. Do not breathe dust.

#### 6.1.1. For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

#### 6.1.2. For emergency responders

| | | |
|---|---|---|
| Protective equipment | : | Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection". |

### 6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

| | | |
|---|---|---|
| For containment | : | Stop leak if safe to do so. |
| Methods for cleaning up | : | Sweep or shovel spills into appropriate container for disposal. Minimize generation of dust. |
| Other information | : | For disposal of solid materials or residues refer to section 13 : "Disposal considerations". |

### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

| | | |
|---|---|---|
| Precautions for safe handling | : | Do not handle until all safety precautions have been read and understood. Ensure good ventilation of the work station. Do not breathe dust, mist, spray. Wear personal protective equipment. Avoid contact with skin and eyes. |
| Hygiene measures | : | Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product. Always wash hands after handling the product. |

### 7.2. Conditions for safe storage, including any incompatibilities

| | | |
|---|---|---|
| Technical measures | : | Comply with applicable regulations. |
| Storage conditions | : | Keep container closed when not in use. Hygroscopic. Keep contents under inert gas. |
| Incompatible materials | : | Refer to Section 10 on Incompatible Materials. |
| Storage area | : | Store in dry, cool, well-ventilated area. |

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

No additional information available

### 8.2. Exposure controls

| | | |
|---|---|---|
| Appropriate engineering controls | : | Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. |
| Hand protection | : | Protective gloves. 29 CFR 1910.138: Hand Protection. |
| Eye protection | : | Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and Face Protection. |
| Skin and body protection | : | Wear suitable protective clothing. |
| Respiratory protection | : | In case of inadequate ventilation wear respiratory protection. 29 CFR 1910.134: Respiratory Protection. |
| Other information | : | Safety shoes. 29 CFR 1910.136: Foot Protection. |

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | Solid |
| Color | : | No data available |
| Odor | : | No data available |
| Odor threshold | : | No data available |
| pH | : | No data available |
| Melting point | : | No data available |
| Freezing point | : | No data available |
| Boiling point | : | 145 °C (@ 10 mm Hg) |
| Flash point | : | No data available |
| Relative evaporation rate (butyl acetate=1) | : | No data available |
| Flammability (solid, gas) | : | No data available |
| Explosion limits | : | No data available |
| Explosive properties | : | No data available |

| | | |
|---|---|---|
| Oxidizing properties | : | No data available |
| Vapor pressure | : | No data available |
| Relative density | : | 1.25 (@ 25 °C) |
| Relative vapor density at 20 °C | : | No data available |
| Molecular mass | : | 500.13 g/mol |
| Solubility | : | No data available |
| Log Pow | : | No data available |
| Auto-ignition temperature | : | No data available |
| Decomposition temperature | : | No data available |
| Viscosity | : | No data available |
| Viscosity, kinematic | : | No data available |
| Viscosity, dynamic | : | No data available |

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No additional information available

### 10.2. Chemical stability

The product is stable at normal handling and storage conditions.

### 10.3. Possibility of hazardous reactions

No additional information available

### 10.4. Conditions to avoid

Keep away from heat, sparks and flame.

### 10.5. Incompatible materials

Strong bases. Strong oxidizing agents.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

| | | |
|---|---|---|
| Acute toxicity | : | Oral: Harmful if swallowed. |
| Skin corrosion/irritation | : | Causes severe skin burns and eye damage. |
| Serious eye damage/irritation | : | Causes serious eye damage. |
| Respiratory or skin sensitization | : | Not classified |
| Germ cell mutagenicity | : | Not classified |
| Carcinogenicity | : | Not classified |
| Reproductive toxicity | : | Not classified |
| Specific target organ toxicity (single exposure) | : | May cause respiratory irritation. |
| Specific target organ toxicity (repeated exposure) | : | Not classified |
| Aspiration hazard | : | Not classified |
| Symptoms/injuries after inhalation | : | Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea. |

## SECTION 12: Ecological information

### 12.1. Toxicity

No additional information available

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods : Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber.

Waste disposal recommendations : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Additional information : Recycle the material as far as possible.

## SECTION 14: Transport information

**Department of Transportation (DOT)**

In accordance with DOT

Transport document description : UN3261 Corrosive solid, acidic, organic, n.o.s., 8, II

UN-No.(DOT) : UN3261

Proper Shipping Name (DOT) : Corrosive solid, acidic, organic, n.o.s.

Transport hazard class(es) (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

Hazard labels (DOT) : 8 - Corrosive


Packing group (DOT) : II - Medium Danger

DOT Packaging Non Bulk (49 CFR 173.xxx) : 212

DOT Packaging Bulk (49 CFR 173.xxx) : 240

DOT Symbols : G - Identifies PSN requiring a technical name

DOT Special Provisions (49 CFR 172.102) : IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).
IP2 - When IBCs other than metal or rigid plastics IBCs are used, they must be offered for transportation in a closed freight container or a closed transport vehicle.
IP4 - Flexible, fiberboard or wooden IBCs must be sift-proof and water-resistant or be fitted with a sift-proof and water-resistant liner.
T3 - 2.65 178.274(d)(2) Normal..... 178.275(d)(2)
TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx) : 154

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 15 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 50 kg

| | | |
|---|---|---|
| DOT Vessel Stowage Location | : | B - (i) The material may be stowed ''on deck'' or ''under deck'' on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ''On deck only'' on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded. |
| Other information | : | No supplementary information available. |

### TDG

No additional information available

### Transport by sea

| | | |
|---|---|---|
| UN-No. (IMDG) | : | 3261 |
| Proper Shipping Name (IMDG) | : | CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. |
| Class (IMDG) | : | 8 - Corrosive substances |
| Packing group (IMDG) | : | II - substances presenting medium danger |

### Air transport

| | | |
|---|---|---|
| UN-No. (IATA) | : | 3261 |
| Proper Shipping Name (IATA) | : | Corrosive solid, acidic, organic, n.o.s. |
| Class (IATA) | : | 8 - Corrosives |
| Packing group (IATA) | : | II - Medium Danger |

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

| **Perfluorooctanesulfonic acid (1763-23-1)** | |
|---|---|
| Listed on the United States TSCA (Toxic Substances Control Act) inventory | |
| EPA TSCA Regulatory Flag | S - S - indicates a substance that is identified in a proposed or final Significant New Uses Rule. |

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

### 15.2. International regulations

#### CANADA

| **Perfluorooctanesulfonic acid (1763-23-1)** |
|---|
| Listed on the Canadian NDSL (Non-Domestic Substances List) |

#### EU-Regulations

No additional information available

#### National regulations

| **Perfluorooctanesulfonic acid (1763-23-1)** |
|---|
| Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)<br>Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory<br>Japanese Pollutant Release and Transfer Register Law (PRTR Law)<br>Listed on INSQ (Mexican national Inventory of Chemical Substances) |

### 15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

## SECTION 16: Other information

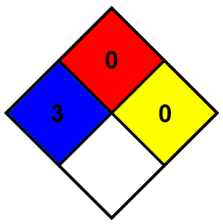
Full text of H-phrases:

| | |
|---|---|
| Acute Tox. 4 (Oral) | Acute toxicity (oral) Category 4 |
| Eye Dam. 1 | Serious eye damage/eye irritation Category 1 |
| Skin Corr. 1B | Skin corrosion/irritation Category 1B |
| STOT SE 3 | Specific target organ toxicity (single exposure) Category 3 |
| H302 | Harmful if swallowed |
| H314 | Causes severe skin burns and eye damage |
| H318 | Causes serious eye damage |
| H335 | May cause respiratory irritation |

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.




HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

SDS US (GHS HazCom 2012)

*The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.*