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REPORT ON 2018 STORMWATER AND SURFACE WATER ACTIVITIES
VOLUME I – TEXT, TABLES, FIGURES

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701 Daniel Webster Highway
Merrimack, New Hampshire 03054
NHDES Site No.: 199712055
Project Number: 36430

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REPORT ON 2018 STORMWATER AND SURFACE WATER ACTIVITIES - VOLUME I - REPORT

Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Submitted to:

New Hampshire Department of Environmental Services

Hazardous Waste Remediation Bureau
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1.0 INTRODUCTION

On behalf of Saint-Gobain Performance Plastics (SGPP), Golder Associates Inc. (Golder) prepared this report summarizing the results of stormwater and surface water investigation activities conducted during calendar year 2018 at the SGPP facility (site) located at 701 Daniel Webster Highway in Merrimack, New Hampshire (Figure 1).

Golder performed the activities described in this report in general accordance with the Work Plan for 2018 Stormwater and Surface Water Investigation prepared by Golder Associates (2018 StW-SW WP; Golder, 2018b). The 2018 Work Plan was prepared in response to a March 14, 2018 NHDES letter (NHDES, 2018a) that provided written comments on the Stormwater and Surface Water Investigation Summary Report (StW-SW ISR; Golder, 2018b). NHDES approved the 2018 StW-SW WP and provided additional comments in an April 13, 2018 letter (NHDES, 2018b). Together the 2018 StW-SW WP and the April 13, 2018 NHDES letter represent Golder's understanding of the stormwater and surface water sampling requirements for the SGPP facility for 2018 (work plan). Golder's response to NHDES' April 13, 2018 comments on the 2018 StW-SW WP are provided in Appendix A-1. DES provided further comments on the scope of the 2018 StW-SW WP in a comment letter on August 28, 2018. Golder's response to NHDES' August 28, 2018 comments on the 2018 StW-SW WP are provided in Appendix A-2.

This report provides a summary of the results of calendar year 2018 stormwater conveyance system maintenance activities, analytical results of stormwater, surface water and sediment sampling, a summary of findings, and recommended next steps.

2.0 BACKGROUND

The following sections provide an overview of the facility and site stormwater conveyance system, and a summary of previous stormwater conveyance system investigation activities.

2.1 Overview of Facility and Stormwater Conveyance System

General Electric (GE) developed the site property in 1971 and continued to operate at the location until approximately 1982. The GE-owned property consisted of approximately 170 acres located between Daniel Webster Highway and the Merrimack River, and included the existing 90,000-square-foot manufacturing building (referred to as the "Main Building"), several outbuildings, railway spurs, and a stormwater conveyance system which collects runoff from the developed portion of the property (Figure 2).

In 1984, Chemical Fabrics Corporation (Chemfab) purchased the property from GE and in 1987, sub-divided and sold approximately 150 acres of the wooded/predominantly-undeveloped land surrounding the facility. As part of the sale, an easement was established for the portions of the stormwater conveyance system located between the eastern Chemfab property boundary and the Merrimack River. In the mid- to late-1990s, Chemfab constructed a 55,000-square foot addition (referred to as the "New Manufacturing Building") east of the facility's Main Building; a portion of the stormwater conveyance system appears to have been reconfigured to accommodate the new construction. SGPP acquired Chemfab in 2000 and assumed ownership of the site.

The current stormwater conveyance system generally follows the layout of the system installed ca. 1971. The stormwater conveyance system receives runoff from the ground and from facility roofs (see Figure 2). Runoff from the roof of the Main Building flows to the stormwater conveyance system via roof drains plumbed inside the building. Runoff from the New Manufacturing Building flows to the stormwater conveyance system via two routes: from roof drains that are plumbed directly to the stormwater conveyance system, and from exterior downspouts that discharge to the paved ground surface to the east of the New Manufacturing Building, then to stormwater catch basins via surface flow. In addition, there are several swales west of the Main Building that direct over-land flow from off-site areas and the western part of the property toward catch basins located north and south of the Main Building. The facility has installed filter socks over the catch basins as part of their stormwater Best Management Practice Plan and maintains a Stormwater Pollution Prevention Plan (SWPPP) to address stormwater discharges (SGPP, 2015).

The stormwater conveyance system for the site consists of two main “branches” that collect stormwater to the north and south of the Main Building/New Manufacturing Building, as shown on Figure 2. The north and south branches of the system join southeast of the Main Building at manhole MH-29, and the combined flow discharges to the Merrimack River at Outfall 001 under National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) number NHR05BO10, which expires on June 4, 2020. This outfall is the only outfall associated with the SGPP facility shown on historical site drawings, and no other outfalls associated with the facility are known to exist.

2.1.1 Previous Stormwater Conveyance System Investigation Activities

Golder submitted a work plan to NHDES for preliminary stormwater conveyance systems investigations on August 11, 2017 (Golder 2017a). In response to NHDES comments (NHDES, 2017a; NHDES, 2017b), revisions to the work plan were submitted on October 6, 2017 and an addendum was submitted on November 13, 2017.

Results of stormwater investigation activities conducted in accordance with these documents in 2017 were submitted to NHDES in the Stormwater and Surface Water Investigation Summary Report in January 2018 (StW-SW ISR; Golder, 2018a). Representatives of SGPP, Golder and NHDES met on February 22, 2018 to discuss the findings of the StW-SW ISR and the scope of proposed additional stormwater and surface water investigation activities. NHDES issued written comments on the StW-SW ISR on March 14, 2018 (NHDES, 2018a), which included a request for an addendum to the StW-SW ISR. Golder submitted a Stormwater and Surface Water Investigation Summary Report Addendum on April 20, 2018 (Golder, 2018c).

Findings from 2017 investigation activities include the following:

- Per- and polyfluoro-alkyl substances (PFAS) were detected in samples collected from the facility stormwater conveyance system under dry-weather conditions. Dry-weather flow at Outfall 001 appeared to be the result of groundwater infiltration into the stormwater conveyance system where portions of the conveyance system piping are at least periodically partially beneath the water table. Data gaps associated with the dry-weather flow conditions included temporal/seasonal trends in:
  - Groundwater elevations near the stormwater conveyance system.
  - Flow volume.
  - PFAS concentrations at Outfall 001.
  - PFAS concentrations in the Merrimack River.
- PFAS were detected in samples collected from the facility stormwater conveyance system under wet-weather flow conditions. Source(s) of PFAS detected in wet-weather flow, other than groundwater infiltration into the piping, were not identified. Data gaps associated with the wet-weather flow conditions included:
  - Source(s) of PFAS detected in wet-weather flow.

  - Temporal/seasonal trends in wet-weather flow volume, PFAS concentrations at Outfall 001, and PFAS concentrations in the Merrimack River.
  - Nature of stormwater flow onto the property from the west and north.
- PFAS were detected in samples collected from Dumpling Brook under dry-weather conditions and appear to increase between the upstream sampling location (Daniel Webster Highway) and the confluence with the Merrimack River. Data gaps associated with Dumpling Brook included:
  - Source(s) of PFAS detected in dry-weather flow.
  - Concentrations of PFAS under wet-weather conditions.
  - Dumpling Brook flow rates.
  - Temporal/seasonal trends PFAS concentrations in Dumpling Brook at the monitoring location upgradient of Daniel Webster Highway, through the Flatley Property, prior to discharge into the Merrimack River, and in the Merrimack River upgradient, downgradient and along the confluences with Dumpling Brook.

2.1.2 Investigation Objectives and Activities

This section presents the objectives and activities for the 2018 stormwater and surface water investigations as outlined in the 2018 StW-SW WP. For the purpose of this report and as presented in the work plan:

- A "wet-weather" event is defined as greater than 0.25 inches of rainfall that occurs at least 72 hours (3 days) after a previous measurable storm event.
- "First flush" is defined as the first half-hour of measurable discharge associated with a wet-weather event.
- "Non-First Flush" is defined as samples collected during a wet-weather event, but outside of the first half hour (i.e., first flush) of the event.
- "Dry-weather flow" is defined as flow following a period of more than 72 hours (3 days) without any measurable rain, based on data from the facility rain gauge.

Investigation objectives for the 2018 stormwater and surface water assessment as outlined in the work plan include:

1) Identify the source of PFAS in wet-weather flow at the facility
2) Evaluate temporal/seasonal trends in wet-weather flow volume, PFAS concentrations at Outfall 001, and PFAS concentrations in the Merrimack River
3) Investigate water quality and assess flow rates in Dumpling Brook between Daniel Webster Highway and the Merrimack River at locations that are accessible

In addition, to respond to requests presented in NHDES' March 14, 2018 comment letter (NHDES, 2018a) the following objectives were added to the 2018 investigations:

1) Investigate sediment quality in publicly accessible areas in the vicinity of the northern confluence of Dumpling Brook and the Merrimack River
2) Investigate water quality in the unnamed brook identified by NHDES to the north of facility

Golder completed the following activities to meet these objectives:

- Continued monitoring of a rain gauge at the facility to document precipitation events
- Continued monitoring of a flow meter at manhole MH-29 to document flow rates in the stormwater conveyance system
- Continued monitoring of pressure transducers in monitoring wells MW-03S and MW-03
- Documentation of observations of the facility's stormwater conveyance system under dry-weather conditions, with contemporaneous groundwater elevation measurements at the Facility's groundwater monitoring wells
- Stormwater Conveyance System maintenance activities including:
  - Camera-survey and clean-out of the facility's stormwater conveyance system roof drains
  - Partial lining and grout injections around manholes and catch basins for targeted portions of the stormwater conveyance system that were identified to be located below the water table
  - Post-lining camera inspections
  - Other maintenance activities described in the work plan, as described in Sections 2.4 and 2.5 below
- Collection and analysis of stormwater samples from the Facility stormwater conveyance system
- Collection and analysis of surface water samples from Dumpling Brook between Daniel Webster Highway and the Merrimack River
- Collection and analysis of surface water samples from the Merrimack River in the vicinity of the SGPP Outfall and Dumpling Brook
- Collection and analysis of surface water samples from two unnamed brooks north of facility as identified by NHDES

3.0 STORMWATER CONVEYANCE SYSTEM ASSESSMENT AND MAINTENANCE

This section summarizes activities completed in 2018 and early 2019 as part of the stormwater conveyance system maintenance at the site. The location of catch basins, drainage structures, and the stormwater conveyance piping configuration is depicted on Figure 2.

3.1 Precipitation Monitoring

Golder installed a tipping-bucket rain gauge at the facility on March 27, 2018 to document precipitation events and identify periods of wet- and dry-weather for stormwater flow observations and stormwater and surface water sampling (discussed further below). Data were collected through December 21, 2018, when the gauge was then removed for the winter. A summary of site and Manchester-Boston Regional Airport precipitation data is provided as Figure 3.

Approximately 37.4 inches of rain fell during the monitoring period from March 27, 2018 through December 21, 2018, with relatively dry conditions during May and wet conditions in August, September and November. Monthly rainfall in 2018 and average monthly rainfall at the Manchester-Boston Regional Airport are provided as Table 1.

According to the National Weather Service, the total precipitation in 2018 at the Manchester-Boston Regional Airport was 51.58 which is 7.00 inches higher than average and the highest annual rainfall recorded since 2008.

3.2 Flow Meter Monitoring

Golder subcontracted Flow Assessment Services, LLC (Flow Assessment) to install a flow meter consisting of an ultrasonic depth sensor, pressure depth sensor, and velocity sensor approximately 10 feet downstream of manhole MH-29. The flow meter was installed on November 9, 2017. Flow Assessment provided data quality review and regularly visited the site to verify flow readings. Flow rates recorded during 2018 ranged from approximately 1 to 15 gallons per minute (gpm) under dry-weather conditions and up to 5,225 gpm[1] under wet-weather conditions. The highest recorded flow rate was associated with a precipitation event on June 28, 2018 when 0.35 inches of rainfall was recorded at the site rain gauge over a period of approximately 18 minutes. Details of flow meter data are presented in Section 3.

3.3 Dry-Weather Flow Observations

Between April 2018 and January 2019, Golder preformed nine rounds of dry-weather flow observations of the facility's stormwater conveyance system, which included:

- Observations at select stormwater catch basins, site drainage swales and Outfall 001 to document the presence or absence of dry-weather flow
- Manual (field) measurement of dry-weather flow rate at Outfall 001 using a pole-mounted sample bucket
- Groundwater elevation measurements at site monitoring wells

Dry-weather flow observations are summarized in Table 2. Key observations include the following:

- Flow was not observed under dry-weather conditions in the drainage to the west of the main parking lot (SGPP-Drainage-001).
- Flow was not observed under dry-weather conditions in the swale upstream of CB-1 (SGPP-Drainage-002), until the November 30, 2018 observation event. Flow was observed from the drainage ditch into catch basin CB-1 during the November 2018 through January 2019 observation events, which could be attributable to snow/ice melt.
- Dry-weather flow was observed during eight of nine observation events in the southern branch of the stormwater conveyance system in on-property manhole MH-23.
- Dry-weather flow was observed during all nine observation events in the southern branch of the stormwater conveyance system in off-property manhole MH-28.
- Dry-weather flow was observed during eight of nine observation events in the northern branch of the stormwater conveyance system in on-property manhole MH-5. Dry weather flow was not observed in MH-5 during the October 2018 observation event, the first observation after completion of the first phase of CIPP Lining (see Section 2.5.3). Dry-weather flow was observed in MH-5 during the December 2018 and January

[1] The flow meter recorded a flow rate of 145,369 gpm on June 24, 2018, and 5,250 gpm on July 23, 2018. However, these readings are considered anomalous: On June 24, total rainfall recorded at the facility rain gauge was approximately 0.02 inches prior to the measured flow rate. On July 23, rainfall was not recorded at the facility rain gauge, and only 0.17 inches of rain was recorded at the Manchester-Boston Regional Airport.

2019 observation events following over 7 inches of rain in November 2018 (see Table 1) and an approximate 2-foot rise in groundwater elevation at MW-03S and MW-03 (Table 2).

- Dry-weather flow was observed during all nine observation events in the northern branch of the stormwater conveyance system in off-property manhole MH-13.
- Dry-weather flow in the southern branch of the stormwater conveyance system appeared to be of lesser volume than the dry-weather flow in the northern branch during all observation events, with the exception of the October 2018 observation event.
- Dry-weather flow was observed at Outfall 001 during all nine observation events. Manual (field) dry-weather flow measurements at Outfall 001 ranged between approximately 1.0 and 15.9 gpm. Comparison of manual Outfall 001 flow measurements to those recorded by the flow meter indicate that most readings were within approximately 1 to 2 gpm, which is considered to be within the approximate accuracy of the field measurements. However, in some cases, Golder's manual flow measurements were approximately 5 or more gpm higher than the rate recorded by the flow meter. This difference may be due to the difference in measurement location (i.e., electronic flow meter measurements are made downstream of MH-29, manual measurements are made at the outfall).

Groundwater elevation data for 2018 are summarized in Table 3. Figure 4 presents a comparison of catch basin invert elevations to December 2018 groundwater elevation contours. As illustrated on Figure 4, the water table in December 2018 was higher than invert elevations of some portions of the stormwater conveyance system. The groundwater elevation contours for the December 2018 event represent the highest measured groundwater elevations since installation of monitoring wells in 2016. The areas where the water table is higher than stormwater water conveyance system invert elevations will vary seasonally with fluctuations in the water table elevation.

3.4 Roof Drain Assessment and Cleaning

Golder subcontracted EcoClean, LLC (EcoClean) of Portland, Maine to complete a push-camera survey and cleaning of the main building roof drain system. Golder did not complete a camera survey or cleaning of the New Manufacturing Building roof drain system because materials/debris were not observed during 2017 activities. EcoClean performed a pre-cleaning camera survey of the roof drain system on April 23, 2018 and performed the roof drain cleaning and post-cleaning camera survey on May 17 and 21, 2018. Roof drain camera survey videos are included in Appendix B-1 (pre-cleaning) and Appendix B-2 (post-cleaning). The layout of the roof drain system is depicted in Figure 5.

3.4.1 Roof Drain Clean-Out

EcoClean used a high-velocity water jet to clean the Main Building roof drain system. Wash water was contained at the nearest downstream catch basin sump where the water, sediment, and debris were removed by Clean Harbors Inc. (Clean Harbors) using a vactor truck and taken to Clean Harbors Lambton (Sarnia) Landfill Facility in Corunna, Ontario for incineration and disposal. Waste disposal manifests are included in Attachment A of Appendix D.

3.4.2 Post Cleanout Roof Drain Camera Survey

Post-cleaning roof drain camera survey videos are included in Appendix B-2. Key observations include the following:

- Residual cleaning water is visible in most of the camera survey footage.
- Main Building Northwest Roof Drain Line:
  - RD-6 to RD-7: Solids/debris observed.
  - RD-7 to RD-8: Solids/debris observed from approximately 1 to 10 ft downstream of RD-7.
  - RD-8 to RD-9: No solids/debris observed.
  - RD-9 to CB-03: No solids/debris observed.
- Main Building Northeast Roof Drain Line:
  - RD-13 to RD-12: Solids/debris observed from approximately 0 to 40 ft downstream of RD-13.
  - RD-12 to RD-11: Solids/debris observed in the bottom and sides of the pipe in several areas from approximately 0 to 20 ft.
  - RD-11 to RD-10: No solids/debris observed.
  - RD-10 to MH-4: No solids/debris observed except at approximately -1.5 to -1 ft.
- Main Building Southeast Roof Drain Line:
  - RD-14 to RD-15: Solids/debris observed, primarily in the first 50 feet downstream of RD-14.
  - RD-15 to RD-16: Solids/debris observed in several areas.
  - RD-16 to RD-17: Solids/debris observed in several areas.
  - RD-17 to RD-18: No solids/debris observed.
  - RD-18 to DI-20: No solids/debris observed.
- Main Building Southwest Roof Drain Line:
  - RD-5 to RD-4: Solids/debris observed in several areas.
  - RD-4 to RD-3: Some solids/debris observed at approximately 19 to 22 ft.
  - RD-3 to RD-2: Solids/debris observed in several areas.
  - RD-2 to RD-1: Some accumulated material observed in the bottom of the pipe at approximately 3 to 11 ft.
  - RD-1 to CB-19: No solids/debris observed.

Based on the results of the 2018 roof drain camera survey, accumulated solids were predominantly observed in the most upstream portions of the roof drain system of the Main Building (i.e., near the centerline of the roof). The presence of solids after cleaning indicates that the materials are not mobilized by the high velocities of the cleaning equipment.

3.4.3 Roof Cleaning and BMPPs

SGPP completed routine inspections of the roof, and initiated removal of char materials if observed to be present during 2018. SGPP installed filter socks on the roof to reduce the potential for mobility of char pieces between roof cleaning events during the second quarter of 2018. SGPP submitted a letter to NHDES summarizing roof cleaning activities and BMPPs on January 22, 2019. This letter is included as Appendix C.

3.5 Stormwater Conveyance System Cleaning and Repairs

Golder subcontracted EcoClean to conduct additional camera surveying, cleaning, and partial lining of the facility's stormwater conveyance system. The camera surveys were conducted to assess the integrity of the system and document pre-lining conditions and to evaluate the cleaning and lining activities. The following describes the pre-lining camera survey, the cleaning activities, lining, and post-lining camera surveys. SGPP completed the stormwater conveyance system repairs to reduce dry-weather flow in on-property portions of the stormwater conveyance system at the Facility.

3.5.1 Pre-Lining Camera Survey

EcoClean completed a camera survey of the stormwater conveyance system on April 10, 2018 to assess the integrity of the system and to document pre-lining conditions. EcoClean targeted portions of the stormwater conveyance system expected to be below the water table as identified in Figure 7 of the StW-SW ISR (Golder, 2018a), based on June 2017 groundwater level data. Pre-lining camera survey videos and pipe condition assessment reports are included in Appendix B-3. The observations of conditions in the stormwater conveyance system during the April 2018 camera survey were generally in keeping with conditions observed during the August 2017 camera survey, with a few additional locations of infiltration noted. Figures 1 and 2 of Appendix D summarize the pipe condition observations from both the 2017 and April 2018 camera surveys.

3.5.2 Cleaning

EcoClean cleaned of select portions of the stormwater conveyance system using a high-velocity water jet on June 14, 2018. Water, sediment and debris generated during cleaning was contained by Clean Harbors at the nearest downstream catch basin sump and removed using a vactor truck. The wash water and solids were shipped from the SGPP facility to Clean Harbors Lambton (Sarnia) Landfill Facility in Corunna, Ontario for incineration and disposal. Waste disposal manifests are included in Appendix D.

3.5.3 Lining Activities

EcoClean began pre-installation activities in June 2018 and completed the lining activities in two phases between September 21 and 26, 2018 (first phase) and October 29 and 30, 2018 (second phase). The lining activities targeted on-property pipe segments and structures where conditions were observed that could allow infiltration of groundwater or exfiltration of stormwater based on observations during camera and pipe condition surveys completed in Fall 2017 and Spring of 2018. The Cured In-Place Pipe (CIPP) lining installation included a total of ten patches and nine liners for a combined length of approximately 300 feet. A CIPP installation summary report is included in Appendix D.

3.5.4 Post-lining Camera Survey

EcoClean completed a camera survey of lined portions of the stormwater conveyance system immediately following lining activities on October 30, 2018. The October 2018 post-lining camera survey videos and pipe condition assessment reports are included in Appendix B-4 and summarized below:

Southern Branch:

- MH-23 to MH-27: no infiltration observed
- CB-22 to MH-23: no infiltration observed

Northern Branch:

- CB-10 to MH-5: no infiltration observed
- CB-1 to CB-3: no infiltration observed
- DI-34 to CB-10: no infiltration observed

3.5.5 January 2019 Post-lining Camera Survey

As discussed in Section 2.5.4, dry weather flow was not observed in MH-5 in October 2018 after the completion of CIPP lining. Following over 7 inches of rain in November 2018 (see Table 1) and an approximate 2-foot rise in groundwater elevation at MW-03S and MW-03 (Table 2), dry-weather flow was observed in the stormwater line during the December 2018 and January 2019 observation events (see Section 2.3 and Table 2). In response, Golder retained EcoClean to complete a camera survey of portions of the stormwater conveyance system expected to be below groundwater based on fourth quarter 2018 groundwater elevations (Figure 4). EcoClean completed this survey on January 28, 2019. The January 2019 post-lining camera survey videos and pipe condition assessment reports are included in Appendix B-5 and summarized below:

Southern Branch:

- MH-16 to CB-21: No infiltration observed. No CIPP lining installed in this segment in 2018.
- CB-21 to CB-22: No infiltration observed. No CIPP lining installed in this segment in 2018.
- CB-22 to MH-23: Infiltration (weeper) observed at one location outside of CIPP-lined areas. Infiltration was not observed in CIPP-lined portions of the pipe. Possible infiltration noted at CB-22.
- MH-23 to MH-27: Infiltration observed at multiple (>10) locations outside of CIPP-lined areas. Infiltration was not observed in CIPP-lined portions of the pipe.
- MH-27 to MH-28: Infiltration observed at multiple (>10) locations. No CIPP lining installed in this segment in 2018.
- CB-26 to MH-23: Infiltration observed at 3 locations. No CIPP lining installed in this segment in 2018.

Northern Branch:

- CB-1 to CB-3: Infiltration observed at three locations outside of CIPP-lined areas. Infiltration was not observed in CIPP-lined portions of the pipe. Surface water (meltwater) inflow observed at CB-1 during survey, not noted in camera survey report but discussed in Section 3.3.
- CB-3 to MH-4: Infiltration observed at five locations outside of CIPP-lined areas. Infiltration was not observed in CIPP-lined portions of the pipe.
- MH-4 to MH-5: Infiltration observed at seven locations outside of CIPP-lined areas and one area adjacent to lined areas. Infiltration was not observed in CIPP-lined portions of the pipe.

- CB-10 to MH-5: Infiltration observed at three locations outside of CIPP-lined areas and one area within a CIPP-lined area. Infiltration was not observed in CIPP-lined portions of the pipe, with the exception of a fold/infiltration at 99.5 ft. Infiltration noted around pipe inlets in MH-5 and CB-10.
- MH-5 to MH-11: Infiltration observed at multiple (>10) locations outside of CIPP-lined areas. Infiltration was not observed in CIPP-lined portions of the pipe.
- MH-11 to MH-12: Infiltration observed at multiple (>10) locations. No CIPP lining installed in this segment in 2018.

3.6 Additional Maintenance Activities

The following is an update on the additional maintenance activities proposed in the work plan:

- Plug and abandon the following unused components of the stormwater conveyance system:
  - Previously unmapped lateral between drain inlet DI-20 and the Hydro-test Building – SGPP plugged and abandoned this lateral on November 27, 2018.
  - Previously unmapped drain line connection to the stormwater conveyance system at manhole MH-32 located adjacent to the water tank building on the Flatley Property near the southwest corner of the SGPP property. This line was not abandoned because the water tank building on the Flatley property is not currently in use.
- Decommission the stormwater infiltration catch basin located south of the facility building: Not completed. SGPP indicated that this catch basin was installed ca. 2015 to prevent winter snow melt from flooding the nearby concrete walk to the east. Golder observed this catch basin during several rain events in 2018 and did not observe stormwater flow into the catch basin. The rim elevation of this catch basin is approximately one inch above the ground surface elevation adjacent to the catch basin, and the surface soils around this catch basin appear to be sufficiently permeable to allow rainfall to infiltrate into the ground and not enter the catch basin. The based on the relatively recent installation date, and lack of stormwater inflow observations during 2018; Golder no longer recommends decommissioning this catch basin.
- Replace the damaged manhole cover at off-property manhole MH-13: Not completed. Flatley plans to relocate this portion of the stormwater conveyance system during redevelopment. Therefore, the repair was not conducted.
- Grout and repair the hole observed in the discharge pipe at drain inlet DI-2, north of the Main Building. This task was completed as part of stormwater conveyance system lining activities as described in Appendix D.
- Removal and off-facility disposal of encrustations/deposits observed in the discharge pipe between manhole MH-7 and catch basin CB-9: EcoClean attempted to remove the hardened deposit in the segment of pipe between structures MH-7 and CB-9 on June 14, 2018 but the material consistency was similar to hardened concrete and could not be removed.
- Evaluate historical records regarding decommissioning of DI-6. The facility did not locate any records regarding the decommissioning of DI-6. The pipeline leading to DI-6 appeared to be capped in the video from the camera survey.

- Evaluate historical records regarding the design and construction of the New Manufacturing Building to identify possible former connections into the patched hole in the vertical section of the roof drain. The facility did not locate any records regarding sub-slab piping in the New Manufacturing building.

4.0 SAMPLING AND SUMMARY OF RESULTS

This section describes the 2018 sampling activities and presents a summary of the results. Golder completed three dry-weather sampling events, three wet-weather sampling events, and sediment sampling in 2018 in general accordance with the work plan. Presentation and discussion of the sampling results are grouped as follows:

- Stormwater Conveyance System and Nearby Merrimack River: includes samples collected from the stormwater conveyance system at MH-5, MH-23, Outfall 001, and samples collected from the Merrimack River at locations upstream of (SW-MERR-101W), near (SW-MERR-201W), and downstream of (SW-MERR-202W) the Outfall 001. At some Merrimack River sampling locations, two samples were collected: a "near-shore" sample ("-NS" sample ID suffix) from within 5 ft of the shoreline and an "in-channel" sample ("-IC" sample ID suffix) from approximately 10 ft offshore.
  - The September 2018[2] sampling event included "source evaluation" sampling which included collection of first flush samples from upstream of MH-5 and MH-23 (CB-24, DI-17, DI-34, RD-MB-NE, RD-MB-NW, RD-NMB, RD-MB-SE, RD-MB-SW, RD-NMB, SGPP-Drainage-001, and SGPP-Drainage-002)) and collection of non-first flush samples from MH-5, MH-23, and Outfall 001.
- Dumpling Brook and Merrimack River Near Dumpling Brook: includes samples collected from Dumpling Brook (SW-DB-101 through SW-DB-109) and the Merrimack River at locations upstream and downstream of the northern (SW-MERR-300 series) and southern (SW-MERR-400 series) confluences of Dumpling Brook and the Merrimack River. "Near-shore" sample ("-NS" sample ID suffix) and an "in-channel" sample ("-IC" sample ID suffix) were collected as described above.
- Unnamed Brooks: includes samples from Unnamed Brook A (SW-UBA-101 and SW-UBA-102) and Unnamed Brook B (UBB-101) located to the north of the Facility.
- Sediment Sampling: includes samples from the Merrimack River near the northern confluence of Dumpling Brook and the Merrimack River.

Table 4 summarizes the stormwater and surface water sampling events for 2018. Sample locations are illustrated on Figures 6 and 7. The upstream sediment sampling location is illustrated on Figure 8. Golder collected surface water samples using a stainless-steel dipper cup and pole. Field parameters measured while sampling surface water included: dissolved oxygen, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Flow rate and water column depth were also recorded in surface water sample locations in Dumpling Brook and the Merrimack River. Field measurements are summarized in Appendix G-4. The hydrologic unit code (HUC) for the sampled portions of the Merrimack River and Dumpling Brook is HUC 12-010700060804. Golder obtained the Merrimack River discharge flow data for each surface water sampling event from the USGS gauging

[2] Some of these locations targeted for sampling upstream of MH-5 and CB-23 were dry during the September 10, 2018 sampling event and were sampled during later sampling events in September and November 2018; as presented in Table 4 and discussed below.

station at Goffs Falls (USGS 01092000) located approximated 4.1 miles upstream of the facility in Manchester, NH.

Samples were submitted to Eurofins Lancaster Laboratories Environmental (ELLE) of Lancaster, Pennsylvania for analysis of PFAS by EPA Method 537 Version 1.1 Modified. Samples were also sent to ELLE or Alpha Analytical of Westboro, Massachusetts (Alpha) for analysis of principal ions and wet chemistry parameters. Validation reports are provided as Appendix F. The May 2018 dry-weather and June 2018 wet-weather samples were analyzed for an expanded list of PFAS parameters. The PFAS target analyte list for stormwater and surface water was revised to 23 compounds to include the additional PFAS compounds detected during the Second Quarter 2018 sampling dry- and wet-weather sampling events, as identified in Table H-2 in Appendix H.

PFAS analytical results are provided in Tables 5 and 6 for dry-weather and wet-weather sampling events, respectively. Tables summarizing PFAS, principal ion, and wet chemistry data are provided in Appendix G-2 and G-3 for dry-weather and wet-weather sampling events, respectively.

4.1 Stormwater Conveyance System and Nearby Merrimack River

4.1.1 Outfall Dye Study

Golder conducted a dye test to qualitatively evaluate the extent of the outfall mixing zone in the Merrimack River under wet-weather conditions on September 25, 2018. The results of the dye test are presented in Appendix I. After the dye study was conducted, the surface water sample collected at SW-MERR-201-IC during the December 2018 sampling event (see below) was collected from the mixing zone between the outfall and Merrimack River as identified during the dye study.

4.1.2 Dry-Weather Sampling Events Summary

Three dry-weather sampling events, which included collection of samples from the stormwater conveyance system and the Merrimack River, were conducted as follows:

- May 17 and May 24, 2018 - Golder collected dry-weather samples from the stormwater conveyance system (3 samples) and surface water samples from the Merrimack River near Outfall 001 (5 samples) on May 17, 2018. Laboratory receipt of several samples was delayed because the samples were temporarily misplaced by the shipping company. The delayed samples were received by the laboratory at temperatures above the method standard, and therefore were not analyzed. Golder re-sampled the locations that did not meet the temperature standard on May 24, 2018.

  Prior to the May 24, 2018 sampling event, the most recent precipitation occurred on May 19, 2018 (0.32 inches of precipitation). Flow rates during the sampling event, as recorded by the flow meter installed in the stormwater conveyance system downstream of manhole MH-29 ranged from approximately 5.3 gpm to 6.0 gpm (See Appendix G-1). The Merrimack River discharge was approximately 3,200 cubic feet per second (cfs) (1,440,000 gpm) on May 24 (Appendix G-1).

- On August 21, 2018 - Golder collected dry-weather samples from the stormwater conveyance system (3 samples) and surface water samples from the Merrimack River near the stormwater outfall (5 samples). The most recent precipitation event prior to the August 21, 2018 sample event occurred on August 17 and 18, 2018 (0.60 inches of precipitation). Flow rates during the sampling event ranged from approximately 2.6 to 3.8 gpm as recorded by the flow meter (see Appendix G-1). The Merrimack River discharge was approximately 5,260 cfs (2,361,000 gpm) during the dry-weather sampling event (Appendix G-1).

- December 6, 2018 - Golder collected dry-weather samples from the stormwater conveyance system (3 samples) and the Merrimack River near the stormwater outfall (5 samples). The most recent precipitation event prior to the December 6, 2018 sample event occurred on December 2, 2018 (0.84 inches of precipitation). Flow rates during the sampling event ranged from approximately 8.5 gpm to 10.9 gpm as recorded by the flow meter (see Appendix G-1). The Merrimack River discharge was approximately 13,000 cfs (5,835,000 gpm) during the dry-weather sampling event.

4.1.3 Summary of Dry-Weather Sampling Event Results

Dry-weather PFAS analytical results are presented in Table 5. Individual event summary tables, including principal ions and wet chemistry parameters, are provided in Appendix G-2.

- Perfluorooctanoic acid (PFOA) concentrations in dry-weather flow samples from the stormwater conveyance system ranged from 1,600 ng/L (MH-23 in May 2018) to 3,400 ng/L (MH-23 in August 2018). PFOA concentrations in dry-weather flow samples from Outfall 001 ranged from 2,100 ng/L in May 2018 to 3,300 ng/L in December 2018.
- In general, PFAS concentrations were slightly higher at MH-5 than MH-23, but the overall signature of PFAS was similar between the north and south branches of the stormwater conveyance system.
- During the May and August 2018 dry-weather sampling events, PFAS concentrations at Outfall 001 were similar to those observed at MH-5 and MH-23 and similar to the PFAS concentrations detected in shallow groundwater collected from monitoring wells located to the east of the facility (MW-03S and MW-03). These two monitoring wells near the area where groundwater infiltration and dry-weather flow has been observed in the northern branch of stormwater conveyance system. A table of groundwater sampling results from the 2018 Annual Groundwater Summary (Golder, 2019a) is provided in Appendix E.
- December 2018 PFAS concentrations at Outfall 001 were higher than PFAS concentrations detected in samples from MH-5 and MH-23 and shallow monitoring wells MW-03S and MW-03, suggesting the location of groundwater infiltration may have changed after partial lining of the stormwater conveyance system.
- Other PFAS detected above 100 ng/L in samples collected from the dry-weather conveyance system samples from MH-23, MH-5, or Outfall 001 include perfluorobutanoic acid PFBA (up to 170 ng/L), perfluoropentanoic acid PFPeA (up to 560 ng/L), perfluorohexanoic acid PFHxA (up to 760 ng/L), perfluoroheptanoic acid PFHpA (up to 590 ng/L), perfluorononanoic acid PFNA (up to 130 ng/L), perfluoro-octanesulfonic acid PFOS (up to 850 ng/L) and N-ethyl perfluorooctanesulfonamidoacetic acid NEtFOSAA (up to 130 ng/L).
- PFOA concentrations in Merrimack River surface water samples collected upstream of Outfall 001 (SW-MERR-101W-NS) were below 4 ng/L during all sampling events except for the sample collected in May 2018 (22 ng/L). PFOA concentrations in river surface water samples collected adjacent to Outfall 001 ranged from 14 ng/L to 91 ng/L in the near-shore sample (SW-MERR-201-NS) and from 4.9 ng/L to 37 ng/L in the in the mixing zone of Outfall 001 and the river (SW-MERR-201-IC). PFOA concentrations in downriver surface water samples (SW-MERR-202W-NS and SW-MERR-202W-IC) were all below 3 ng/L, indicating that PFOA concentrations attenuate rapidly with distance into the Merrimack River. Other PFAS were not detected above 100 ng/L in Merrimack River surface water samples.

These results are discussed further in Section 5.

4.1.4 Wet-Weather Sampling Events Summary

Four wet-weather sampling events, including the collection of samples from the stormwater conveyance system and Merrimack River, were conducted as follows:

- June 4, 2018 - Golder collected wet-weather samples from the stormwater conveyance system (3 samples) and surface water samples from the Merrimack River near Outfall 001 (2 samples) under first flush conditions. Golder also collected surface water samples from the Merrimack River near Outfall 001 (3 samples) later in the storm. Rainfall began at approximately 5:15 am and first flush conditions were observed at 5:45 am after approximately 0.05 inches of rainfall. Total rainfall during the sampling event was approximately 0.10 inches. The flow meter installed in the stormwater conveyance system recorded peak flow of approximately 280 gpm during the sampling event. The Merrimack River discharge was approximately 1,900 cfs (853,000 gpm) (see Appendix G-1).
- September 10, 2018 - Golder collected wet-weather samples from the stormwater conveyance system (9 samples) and surface water samples from the Merrimack River neat Outfall 001 (2 samples) under first flush conditions. Golder also collected six non-first flush samples as part of the source evaluation. First flush conditions were observed at different times throughout the stormwater conveyance system but were generally observed after approximately 0.01 to 0.02 inches of precipitation, between approximately 3:18 p.m. and 6:20 p.m. Non-first flush samples were collected 1 to 3 hours after the first flush samples, between approximately 6:05 p.m. and 7:30 p.m. Total rainfall during the sampling period was approximately 0.09 inches. The flow meter installed in the stormwater conveyance system recorded peak flow of approximately 29.3 gpm during the sampling event. The Merrimack River discharge was approximately 1,436 cfs (665,000 gpm).
- September 25, 2018 - Golder collected wet-weather samples from SGPP-Drainage-001 and SGPP-Drainage-002 which did not have flow during the September 10, 2018 source evaluation sampling event. Golder also resampled MH-5 and MH-23 for comparison to the September 10, 2018 results. Water samples were collected after flow was first observed in the drainage ditches approximately 2 hours into the storm event and after 0.08 inches of precipitation. Total rainfall during the sampling period was approximately 0.54 inches as shown in Appendix G-1. The flow meter installed in the stormwater conveyance system recorded peak flow of approximately 440 gpm during the sampling event.
- November 13, 2018 - Golder collected wet-weather samples from the stormwater conveyance system (3 samples) and surface water samples from the Merrimack River near Outfall 001 (5 samples) during non-first flush conditions. Golder also sampled drain inlet DI-17 and catch basin CB-24 to complete the sampling of locations that did not have flow during the third quarter source evaluation sampling events. As discussed with NHDES on November 13, 2018, samples for the November 13, 2018 wet-weather event were not collected under first flush conditions due to the early storm start. Collection of surface water samples began at 7:00am; approximately 6 hours after precipitation began and after approximately 0.74 inches of precipitation. When sampling concluded, a total of 0.93 inches of precipitation had fallen. The flow meter installed in the stormwater conveyance system recorded peak flow of approximately 626 gpm during the sampling event. The Merrimack River discharge was approximately 16,000 cfs (7,181,000 gpm).

4.1.5 Summary of Wet-Weather Sampling Event Results

Wet-weather PFAS analytical results are presented in Table 6. Individual event summary tables, including principal ions and wet chemistry parameters, are provided in Appendix G-3.

- June 4, 2018 – First flush Conditions
  - PFOA concentrations in samples collected from the conveyance system ranged from 860 ng/L (MH-23) to 7,600 ng/L (MH-5). The concentration of PFOA in the sample collected from Outfall 001 was 2,200 ng/L, which is similar to the PFOA concentration (2,100 ng/L) observed during dry-weather conditions on May 24, 2018. First flush samples were collected following procedures specified by NHDES as outlined in the work plan. However, it is Golder's opinion that the first flush samples collected from Outfall 001 are not representative of stormwater conditions. The first flush samples collected in 2018 at Outfall 001 at the beginning of low-intensity storms are considered more representative of dry-weather flow that was not completely flushed from the stormwater conveyance system at the time of sample collection.
- September 10, 2018 – First flush Conditions
  - PFOA concentrations in samples collected from the stormwater conveyance system ranged from 880 ng/L (Drainage Inlet DI-34) to 52,000 ng/L (Roof Drain RD-MB-NE). PFAS concentrations were higher in roof drain samples from the northern end of the Main Building. PFOA concentrations were higher in MH-5 (12,000 ng/L) compared to MH-23 (1,400 ng/L) and Outfall 001 (2,500 ng/L). The higher PFOA concentrations in the northern portion of the conveyance system (i.e., MH-5) are attributed to higher PFOA concentrations in flow from northern roof drains of the main building (i.e., RD-MB-NE, 52,000 ng/L and RD-MB-NW, 11,000 ng/L) and flow from the New Manufacturing Building roof drains (i.e., RD-NMB, 4,300 ng/L).
  - The concentration of PFOA in the sample collected from Outfall 001 under first flush conditions (2,500 ng/L) is similar to the PFOA concentration observed during dry-weather conditions on August 21, 2018 (2,700 ng/L), again suggesting that the first flush samples collected in 2018 at Outfall 001 at the beginning of low-intensity storms are considered more representative of dry-weather flow that was not completely flushed from the stormwater conveyance system at the time of sample collection.
  - Other PFAS were detected at concentrations lower than PFOA, except for the following compounds in roof drain samples: 6:2-Fluorotelomer Sulfonate (6:2-FTS) was detected at up to 89,000 ng/L in roof drain sample RD-MB-NE and concentrations of PFHpA, PFHxA, and/or PFPeA were higher than PFOA in roof drain samples RD-MB-NW, RD-MB-SE, RD-MB-SW, and/or RD-NMB.
- September 10, 2018 – Non-first flush Conditions
  - PFOA concentrations in samples collected from the stormwater conveyance system ranged from 1,000 to 3,000 ng/L in samples collected from MH-23 to 7,500 to 20,000 ng/L in MH-5, and generally comparable to the first flush concentrations[3].
  - PFOA was detected in samples collected from at Outfall 001 at a concentration of up to 9,400 ng/L, higher than the detected concentration of 2,500 ng/L under first flush conditions.

[3] Golder collected duplicate volume of the non-first flush samples from MH-5 and MH-23 for analysis of total (uncentrifuged) and dissolved (centrifuged) PFAS. The PFAS concentrations in the dissolved samples were generally higher than the total samples. This is attributed to a number of factors including: 1) variations in sample pre-treatment at the lab due to difficulties encountered when passing the sample though the solid phase extraction cartridge 2) differences in pre-extraction internal standard recovery, 3) loss of pre-extraction external standards after dilution, or 4) results reported from above the calibration range.

- September 25, 2018 – First flush Conditions
  - PFOA concentrations in samples collected from MH-5[4] and MH-23 were 1,700 ng/L and 870 ng/L respectively, much lower than the detected September 10 first flush concentrations.
  - PFOA was detected in surface water samples from both drainage swales near the facility (i.e. SGPP-Drainage-001, 110 ng/L and SGPP-Drainage-002, 14 ng/L). Although the drainage swale samples were collected under non-first flush conditions from an outfall perspective (i.e., the samples were collected approximately 8 hours after precipitation began), they were collected within approximately 30 minutes of the first observation of flow at these locations.
- November 13, 2018 – Non-first flush Conditions
  - PFOA concentrations in samples collected from the stormwater conveyance system ranged from 61 ng/L (MH-23) to 1,200 ng/L (MH-5). Overall, PFAS concentrations detected samples collected from the stormwater conveyance system (MH-5, MH-23 and Outfall 001) during the November 2018 non-first flush sampling event are lower than detected concentrations during previous first flush and non-first flush sampling events.
  - Golder also sampled drain inlet DI-17 and catch basin CB-24 to complete the sampling of locations that did not have stormwater inflow during the third quarter source evaluation sampling events. PFOA was detected at a concentration of 4.5 ng/L at drain inlet DI-17 and 9.5 ng/L at catch basin CB-24. Other PFAS were detected at concentrations lower than PFOA, except for perfluorododecanoic acid (PFDoA) in CB-24 (9.9 ng/L).
- Other PFAS detected above 100 ng/L in samples collected from the wet-weather conveyance system samples from MH-23, MH-5, or Outfall 001 include PFBA (up to 2,300 ng/L), PFPeA (up to 4,000 ng/L) and PFHxA (up to 13,000 ng/L), PFHpA (up to 5,300 ng/L), PFNA (up to 350 ng/L), perfluorodecanoic acid PFDA (up to 350 ng/L), perfluoroundecanoic acid PFUnA (up to 130 ng/L), perfluorododecanoic acid PFDoA (up to 110 ng/L), PFOS (up to 4,200 ng/L) and 6:2-FTS (up to 14,000 ng/L).
- 2018 Merrimack River Wet-weather Surface Water Sampling
  - Concentrations of PFOA in Merrimack River surface water samples collected just upstream of Outfall 001 (SW-MERR-101W-NS) were below 4 ng/L except for the sample collected on June 4, 2018 (9.4 ng/L).
  - Concentrations of PFOA in Merrimack River surface water samples collected adjacent to Outfall 001 ranged from 63 ng/L to 350 ng/L in the near-shore sample (SW-MERR-201W-NS) and from 3.8 ng/L to 220 ng/L in the in-channel samples (SW-MERR-201W-IC, i.e., within the mixing zone of Outfall 001 and the river).
  - Concentrations of PFOA in Merrimack River surface water samples collected downstream of Outfall 001 (SW-MERR-202W-NS and SW-MERR-202W-IC) were all below 4.2 ng/L (or not detected with an

[4] On September 25, 2018; manhole MH-5 was not sampled until several hours into the storm event due to contractors (EcoClean) completing lining activities through MH-5.

analytical detection limit of 4.5 ng/L) indicating that PFOA concentrations observed at the outfall attenuate rapidly with distance in the Merrimack River.

- Other PFAS were not detected above 100 ng/L in surface water samples, with the exception of 6:2-Fluorotelomer Sulfonic Acid which was detected at 120 ng/L in the June 2018 sample form SW-MERR-201W-IC.

These results are discussed further in Section 5.

4.2 Dumpling Brook and Merrimack River Near Dumpling Brook

4.2.1 Dumpling Brook Stage and Discharge Monitoring

Staff gauges were installed in Dumpling Brook at sampling locations SW-DB-101 through SW-DB-108 in May of 2018 and were surveyed in June of 2018. Staff gauge and sampling locations are illustrated on Figure 6. Golder collected staff gauge measurements to measure Dumpling Brook surface water elevations as shown in Appendix J-1.

On October 31, 2018, Golder installed a vented Level Troll 500 data logger at staff gauge SW-DB-104 to collect a continuous record of stream stage (depth). Between October 31, 2018 and December 20, 2018, Golder collected five sets of depth/velocity measurements at staff gauge SW-DB-104. Total discharge in Dumpling Brook was calculated using the velocity-area method, where flow was estimated as the product of the stream cross-sectional area and the velocity of flow through the cross-sectional area. To complete this calculation, Golder divided the stream cross section into ten segments, and measured depth of water (to estimate area) and velocity within each segment using a velocity meter. Total discharge was calculated as the sum of the products of area and velocity in each segment. Measurements were taken during periods of wet and dry-weather flow so that a range of flow values were collected. Golder removed the data logger on December 20, 2018 for the winter.

The calculated Dumpling Brook discharge ranged from approximately 1.53 cfs (687 gpm) to 2.37 cfs (1064 gpm) during the dry-weather condition measurements, and approximately 3.80 cfs (1706 gpm) during the only wet-weather condition measurement. The calculated total stream discharge values and corresponding stream stage data as measured by the transducer were used to create a stage-discharge relationship (rating curve) as presented in Appendix J-2.

4.2.2 Dry-Weather Sampling Events Summary

Three dry-weather sampling events, which included collection of samples from of Dumpling Brook and the nearby Merrimack River were conducted as follows:

- May 17/18 and May 24, 2018 - Golder collected 9 surface water samples from Dumpling Brook and 8 surface water samples from the Merrimack River near Dumpling Brook on May 17 and May 18. Laboratory receipt of several samples was delayed because the samples were temporarily misplaced by the shipping company. The delayed samples were received by the laboratory at temperatures above the method standard, and therefore were not analyzed. Golder re-sampled the locations that did not meet the temperature standard on May 24, 2018. The most recent wet weather event prior to the May 17 and 18, 2018 sample event occurred on April 29, 2018 (0.26 inches of precipitation). The most recent wet weather event prior to the May 24, 2018 sample event occurred on May 19, 2018 (0.32 inches of precipitation).

The Merrimack River discharge on May 17 was 4,300 cfs (1,930,000 gpm). Merrimack River discharge on May 18 was 3,130 cfs (1,405,000 gpm). Merrimack River discharge during re-sampling on May 24 was 3,200 cfs (1,440,000 gpm).

- August 28, 2018 - Golder collected 9 surface water samples from Dumpling Brook and 8 surface water samples from the Merrimack River near Dumpling Brook. The primary samples arrived at the laboratory at temperatures above the method standard and were not analyzed for some parameters specified in the work plan, specifically: PFAS or wet chemistry nutrient parameters (ammonia, nitrate, nitrite, sulfate, or sulfite). Golder submitted archived sample volume to the lab for PFAS analysis, however, there was insufficient archive sample volume for the analysis of 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA) or wet chemistry nutrient parameters. The most recent wet weather event prior to the August 28, 2018 sample event occurred on August 22, 2018 (0.47 inches of precipitation). The Merrimack River discharge on August 28 was 2,560 cfs (1,149,000 gpm).

- November 30, 2018 - Golder collected 8 surface water samples from Dumpling Brook and 1 surface water sample from the Merrimack River near Dumpling Brook (SW-MERR-301W-NS). Golder did not collect surface water samples from the other Merrimack River locations and SW-DB-102 due to the high stage of the Merrimack River, which prevented safe access to the sample locations. The most recent wet weather event prior to the November 30, 2018 sample event occurred on November 27, 2018 (0.39 inches of precipitation). The Merrimack River discharge on November 30, 2018 was 12,000 cfs (5,386,000 gpm). Dumpling Brook stage recorded by the data logger at SW-DB-104 was 0.325 ft and the calculated discharge was 2.37 cfs (1064 gpm).

4.2.3 Summary of Dry-Weather Sampling Results

Dry-weather PFAS analytical results are provided in Table 5. Individual event summary tables including principal ions and wet chemistry parameters are provided in Appendix G-2.

- During each sampling event, PFOA concentrations generally increased from upstream (SW-DB-109,190 to 210 ng/L) to downstream (SW-DB-103, 310 to 490 ug/L) along Dumpling Brook. Overall PFOA concentrations were similar during each of sampling event.

- PFOA concentrations at the sampling locations in the meander (SW-DB-101 and SW-DB-102) varied depending on the stage of the Merrimack River relative to the stage of the meander at the Dumpling Brook confluence. During periods of lower river stage (e.g., the May 2018 sampling event) Dumpling Brook discharged to the Merrimack River at the northern end of the meander, and PFOA concentrations at SW-DB-101 were higher than at the southern confluence with the Merrimack River (SW-DB-102). During the November 2018 sampling event, the Merrimack River stage was higher, and flow was observed from the Merrimack River into the northern end of the meander. The concentration of PFOA at SW-DB-101 in November 2018 (3.6 ng/L) was similar to concentrations in the Merrimack River (2.1 ng/L in SW-MERR-301-NS), consistent with the observation of flow from the Merrimack River into the northern end of the meander during this event. Golder did not collect surface water samples from the southern end of the meander during the November 2018 event due to the high stage of the Merrimack River preventing safe access to sample locations.

- Concentrations of PFOA in the Merrimack River upstream of the northern (SW-MERR-301-NS) and southern (SW-MERR-401-NS) confluences with Dumpling Brook were below 10 ng/L. Concentrations of PFOA in the Merrimack River at the northern (SW-MERR-302W-NS and SW-MERR-302W-IC) and southern (SW-MERR-

402W-NS and SW-MERR-402-IC) confluences with Dumpling Brook were below 10 ng/l with the exception of the southern confluence samples collected in August 2018 (SW-MERR-402W-NS: 160 ng/L, SW-MERR-402W-IC: 74 ng/L). Merrimack River samples collected downstream of the northern (SW-MERR-303-NS) and southern (SW-MERR-403-NS) confluences with Dumpling Brook were at or below 14 ng/L. The decrease in concentration at the closest downstream samples from the northern and southern confluences indicates that PFOA concentrations attenuate rapidly with distance in the Merrimack River.

- Other PFAS were detected in dry-weather samples from Dumpling Brook and the nearby Merrimack River at concentrations lower than PFOA. Other PFAS were not detected above 100 ng/L in Dumpling Brook dry-weather surface water samples, with the exception of PFPeA (up to 130 ng/L) and PFHxA (up to 180 ng/L).

These results are discussed further in Section 5.

4.2.4 Wet-Weather Sampling Events Summary

Three wet-weather sampling events, which included collection of samples from of Dumpling Brook and the nearby Merrimack River were conducted as follows:

- June 5, 2018 - Golder collected 9 surface water samples from Dumpling Brook and 8 surface water samples from the Merrimack River near Dumpling Brook. There was no precipitation during the June 5 sample event, however, there was 0.50 inches of precipitation on June 4. The Merrimack River discharge on June 5, 2018 was 2,150 cfs (965,000 gpm).
- October 2, 2018 - Golder collected 9 surface water samples from Dumpling Brook and 8 surface water samples from the Merrimack River near Dumpling Brook. Samples were scheduled to be collected in third quarter 2018 but were collected during the first week of the fourth quarter due to dry weather conditions at the end of the third quarter. Sampling began approximately 7 hours after precipitation began and after 0.14 inches of precipitation. By the time sampling was complete, a total of 0.27 inches of precipitation had occurred. The Merrimack River discharge on October 2, 2018 was 3,400 cfs (1,530,000 gpm).
- November 2, 2018 - Golder collected 9 surface water samples from Dumpling Brook and 5 surface water samples from the Merrimack River near Dumpling Brook. Sample locations on the island near the Merrimack River meander (SW-MERR-302W, SW-MERR-303W, and SW-MERR-401W) could not be accessed during this event due to high Merrimack River stage. Sampling began approximately 7 hours after precipitation began and after 0.30 inches of precipitation. By the time sampling was complete, a total of 0.59 inches of precipitation had occurred. The Merrimack River discharge on November 2, 2018 was 7,091 cfs (3,183,000 gpm). Dumpling Brook stage recorded by the data logger at SW-DB-104 was 0.355 ft.

4.2.5 Summary of Wet-Weather Sampling Results

Wet-weather PFAS analytical results are provided in Table 6. Individual event summary tables including principal ions and wet chemistry parameters are provided in Appendix G-3.

- During each sampling event, PFOA concentrations generally increased from upstream (SW-DB-109, 110 to 220 ng/L) to downstream (SW-DB-103, 340 to 490 ng/L or SW-DB-102, up to 650 ng/L) along Dumpling Brook. Overall PFAS concentrations were similar during each of the sampling events except for the November 2018 sampling event when PFOA concentrations were generally lower than prior sampling events, consistent with the higher intensity storm during this sampling event.

- Concentrations of PFOA in samples collected from locations in the meander at the confluence of Dumpling Brook and the Merrimack River (SW-DB-101 and SW-DB-102) ranged from 2.4 to 650 ng/L, depending on the stage of the Merrimack River relative to the meander. The PFOA concentration was higher at the northern end of the meander (SW-DB-101, 420 ng/L) in October 2018, consistent with the observation of flow from the northern end of the meander to the Merrimack River during this event. The concentration of PFOA was higher at the southern end of the meander (SW-DB-102) relative to the north end of the meander (SW-DB-101) during the November 2018 sampling event, consistent with the observation of flow from the Merrimack River into the northern end of the meander during the sampling event. However, during the June 2018 sampling event, the Merrimack River stage was relatively low, and flow was observed from Dumpling Brook into the River via the north end of the meander, but concentrations were higher at the southern end of the meander.
- Concentrations of PFOA in the Merrimack River upstream of the northern (SW-MERR-301-NS) and southern confluences (SW-MERR-401-NS) with Dumpling Brook were at or below 10 ng/l. Concentrations of PFOA in the Merrimack River at the northern (SW-MERR-302W-NS and SW-MERR-302W-IC) and southern (SW-MERR-402W-NS and SW-MERR-402-IC) confluences with Dumpling Brook were at or below 10 ng/L with the exception of the northern confluence samples collected in October 2018 (SW-MERR-302W-NS: 14 ng/L), the southern confluence samples collected in June 2018 (SW-MERR-402W-NS: 27 ng/L) and November 2018 (SW-MERR-402W-NS: 35 ng/L). The Merrimack River samples collected downstream of the northern (SW-MERR-303-NS) and southern (SW-MERR-403-NS) confluences with Dumpling Brook were below 10 ng/L except for SW-MERR-403-NS on November 2018 (22 ng/L). The concentration decrease in the closest downstream samples from the northern and southern ends of the meander indicates that PFOA concentrations attenuate rapidly with distance in the Merrimack River.
- Other PFAS were detected in wet-weather samples from Dumpling Brook and the nearby Merrimack River at concentrations lower than PFOA. Other PFAS were not detected above 100 ng/L in Dumpling Brook wet-weather surface water samples, with the exception of PFPeA (up to 180 ng/L), PFHxA (up to 240 ng/L) and PFHpA (up to 110 ng/L).

These results are discussed further in Section 5.

4.3 Unnamed Brooks

4.3.1 Dry-Weather Sampling Events Summary

Golder collected two dry-weather samples from two locations in the unnamed brook to the north of the facility (Unnamed Brook A). Golder also collected one dry-weather sample from the unnamed brook at the northern end of the Flatley property (Unnamed Brook B), as follows:

- May 18, 2018 - Golder collected dry-weather surface water samples from two locations in Unnamed Brook A. The most recent wet weather event prior to the May 18, 2018 sampling event occurred on April 29, 2018 (0.26 inches of precipitation).
- December 6, 2018 - Golder collected dry-weather surface water samples from two locations in Unnamed Brook A. The most recent wet weather event prior to the December 6, 2018 sampling event occurred on December 2, 2018 (0.84 inches of precipitation).

- December 6, 2018 - Golder collected one dry-weather surface water sample from Unnamed Brook B at the northern end of the Flatley property (UBB-101) as requested by NHDES in their comments on the Site Investigation Work Plan (NHDES, 2018c).

4.3.2 Wet-Weather Sampling Events Summary

Golder conducted two wet-weather sampling events for Unnamed Brook A as follows:

- June 4, 2018 - Golder collected wet-weather surface water samples from two locations in Unnamed Brook A. Samples were collected approximately 3 hours after the start of the rain event and after approximately 0.10 inches of precipitation (see Appendix G-1). Sampling concluded at Unnamed Brook A after approximately 0.50 inches of precipitation.

- October 2, 2018 - Golder collected wet-weather surface water samples from two locations in Unnamed Brook A. Samples were collected approximately 13 hours after the start of the rain event and after approximately 0.16 inches of precipitation (see Appendix G-1). Sampling concluded at Unnamed Brook A after approximately 0.20 inches of precipitation.

4.3.3 Summary Sampling Results

Concentrations of PFOA in dry-weather samples collected from Unnamed Brook A ranged from 1,000 ng/L (SW-UBA-102) to 1,600 ng/L (SW-UBA-101). PFOA was detected at a concentration of 2,700 ng/L in the one dry-weather surface water sample collected from Unnamed Brook B. The only other PFAS detected above 100 ng/L in dry-weather surface water samples from Unnamed Brook A include PFPeA (up to 130 ng/L), PFHxA (up to 200 ng/L) and PFHpA (up to 160 ng/L). The only other PFAS detected above 100 ng/L in dry-weather surface water samples from Unnamed Brook B include PFPeA (up to 210 ng/L), PFHxA (up to 330 ng/L) and PFHpA (up to 250 ng/L).

Concentrations of PFOA in wet-weather samples collected from Unnamed Brook A ranged from 310 ng/L (SW-UBA-102) to 1,300 ng/L (SW-UBA-101). The only other PFAS detected above 100 ng/L in Unnamed Brook A wet-weather surface water samples included PFPeA (up to 110 ng/L), PFHxA (up to 170 ng/L) and PFHpA (up to 120 ng/L). A wet-weather sample was not collected from Unnamed Brook B.

These results are discussed further in Section 5.

4.4 Merrimack River Sediment

4.4.1 Sampling Event Summary

On September 6, 2018, Golder collected sediment samples from three locations near the northern confluence of Dumpling Brook and the Merrimack River (SED-MERR-301W, SED-MERR-302W, SED-MERR-303W) and an upstream location (SED-MERR-US-2018A) from a beach near the railroad bridge at the end of Moores Crossing Road in Bedford, New Hampshire. The SED-MERR-300 series samples were collocated with surface water sampling locations shown on Figure 6 (e.g., SED-MERR-301W was collected at the SW-MERR-301W sample location). The upstream sediment sampling locations are illustrated on Figure 8.

Golder submitted the sediment samples under chain-of-custody procedures to ELLE for analysis of PFAS and TOC and to GeoTesting Express of Acton, Massachusetts for grain size analysis. Validated data and grain size data are provided in Table 7.

4.4.2 Summary of Sediment Sampling Results

The following PFAS were detected (J-flagged) at very low (i.e., less than 1 ng/g) concentrations in the most downstream sample location (SED-MERR-303W): perfluorotridecanoic acid PFTrDA (0.28J ng/g), perfluorotetradecanoic acid PFTA (0.62J ng/g), and perfluorohexadecanoic acid PFHxDA (0.4J ng/g). PFAS were not detected in any of the samples collected from the remaining three sample locations.

5.0 FINDINGS

5.1 2018 Stormwater Conveyance System Assessment and Maintenance Findings

Accumulated solids were predominantly observed in the most upstream portions of the roof drain system of the Main Building (i.e., near the centerline of the roof) during the 2018 roof drain camera survey. The presence of solids after clean-out activities indicates that the materials are not mobilized by the high velocities of the cleanout equipment.

The mainline camera survey completed after CIPP installation indicated infiltration was eliminated at areas targeted for lining. However, rainfall in 2018 and particularly November 2018 was higher than average. As a result, groundwater levels rose approximately 2 feet between October 2018, when the lining work was completed and no dry-weather flow was observed in MH-5, and December 2018 when dry weather flow was observed in MH-5 (Table 2). The flow observed in December 2018 is attributed to the higher groundwater levels that resulted from the higher than average precipitation in November 2018.

5.2 2018 Stormwater and Surface Water Investigation Findings

The following summarizes the findings from the 2018 stormwater and surface water investigation activities described in Section 4 in the context of the study objectives presented in Section 1.2.

Objective 1: Identify the source of PFAS in wet-weather flow at the facility

PFAS concentrations in samples collected from the Main Building roof drains are the highest concentrations detected during the wet-weather sampling events (e.g., PFOA was detected at concentrations of 52,000 ng/L and 11,000 ng/L respectively in wet-weather, first flush samples collected from RD-MB-NE and RD-MB-NW in September 2018). PFAS concentrations were higher in roof drain samples from the northern end of the Main Building. Therefore, run-off from the north end of the Main Building and the New Manufacturing Building is considered the primary the source of higher PFAS detections in samples collected from MH-5 under wet-weather first flush conditions. However, PFAS were also detected in wet-weather samples collected from locations that do not receive flow from the roof drains, including catch basins and drainage swales upstream of MH-5 and MH-23. For example, PFOA was detected at 880 ng/L in the sample collected from drain inlet DI-34 and at 110 ng/L in the sample collected from Drainage-001, which receives stormwater flow from areas off and to the west of the SGPP property. Therefore, run-off from the building roofs is not the only source of PFAS in wet-weather stormwater flow. In addition to upgradient sources, the inflow of PFAS-impacted groundwater into the stormwater conveyance system is also a likely contributor of some the PFAS detected in wet-weather flow in the stormwater conveyance system, particularly during low intensity precipitation events. See Section 4.1.4 for additional details.

Objective 2: Evaluate temporal/seasonal trends in wet-weather flow volume, PFAS concentrations at Outfall 001, and PFAS concentrations in the Merrimack River

The following summarizes the findings related to temporal trends in wet-weather flow based on the four 2018 wet-weather sampling events:

- Little variation in PFAS concentrations was observed in samples collected from the stormwater conveyance system and the outfall between the two first flush sampling events (i.e., June and September 2018).
- The concentration of PFAS in samples collected from Outfall 001 under wet-weather first flush conditions were similar to the concentrations in samples collected under dry-weather conditions, and lower than concentrations detected in samples collected from the upstream manholes (MH-5 or MH-23). It is likely that the wet-weather analytical results for Outfall 001 collected under first flush conditions during low-intensity storms are more representative of dry-weather flow that was not completely flushed from the stormwater conveyance system prior to sample collection due to the required timing of first flush sample collection.
- PFAS concentrations in all November 13, 2018 wet-weather event samples and the September 25, 2018 sample from MH-5 collected under non-first flush conditions (i.e., several hours after precipitation began) were lower than PFAS concentrations in samples collected under first flush conditions. This indicates that the concentrations observed under first flush conditions are not representative of PFAS concentrations during longer duration and/or higher intensity precipitation events.
- There is little variation in PFOA concentrations in samples collected from the Merrimack River upstream (SW-MERR-101W-NS) and downstream (SW-MERR-202W-NS, -IC) of Outfall 001 between wet-weather and dry-weather sampling events. Most PFOA results for samples collected from these locations are <5 ng/L. There is more variation in the PFOA concentrations in river samples collected adjacent to Outfall 001 which ranged from 63 ng/L to 350 ng/L in the near-shore sample (SW-MERR-201W-NS) and from 3.8 ng/L to 220 ng/L in the mixing zone (SW-MERR-201W-IC) of Outfall 001 and the Merrimack River. The observed variation in PFOA concentrations at SW-MERR-201W is likely due to variations in outfall flow intensity and the geometry of the mixing zone in the river. However, the consistently low PFOA concentrations at downstream river sample locations SW-MERR-202W-NS and -IC indicates that PFOA concentrations observed at the outfall attenuate rapidly with distance in the Merrimack River regardless of the intensity of flow from Outfall 001. This is consistent with the observed discharge of the river (up to 5,835,000 gpm) compared to Outfall 001 (up to 626 gpm under wet weather conditions) during the sampling events.
- See Section 4.1.4 for additional details.

Objective 3: Investigate water quality and assess flow rates in Dumpling Brook between Daniel Webster Highway and the Merrimack River at locations that are accessible

Golder completed three dry-weather and three wet-weather sampling events at Dumpling Brook and Merrimack River near Dumpling Brook. PFAS concentrations in Dumpling Brook generally increase from upstream near Daniel Webster Highway (SW-DB-109,190 to 210 ng/L) to downstream near the confluence with the Merrimack River (SW-DB-103, 310 to 490 ng/L). Overall PFOA concentrations along Dumpling Brook upstream of the meander were similar during each sampling event.

PFAS concentrations in surface water samples collected at the northern and southern confluences of Dumpling Brook and the Merrimack River vary depending on the stage of the Merrimack River, as discussed in Section

4.2.3 and 4.2.5. PFAS concentrations in Merrimack River samples near and downstream of the northern (SW-MERR-302W-NS, SW-MERR-302W-IC, SW-MERR-303W-NS) and southern (SW-MERR-402W-NS, SW-MERR-402W-IC, SW-MERR-403W-NS) confluences with the Merrimack River are lower than within the meander indicating that PFAS concentrations attenuate rapidly in the Merrimack River within a short distance of the confluences with Dumpling Brook.

The calculated Dumpling Brook discharge ranged from approximately 1.53 cfs (687 gpm) to 2.37 cfs (1064 gpm) during the dry-weather condition measurements, and approximately 3.80 cfs (1706 gpm) during the only wet-weather condition measurement. The calculated total stream discharge values and corresponding stream stage data as measured by the transducer were used to create a stage-discharge relationship (rating curve) as presented in Appendix J-2. Based on the measurements collected, a relationship between stage and discharge can be discerned.

See Sections 4.2.3 and 4.2.5 for additional details.

The following objectives are related to requests from the NHDES March 14, 2018 comment letter (NHDES, 2018a):

NHDES Request 1: Investigate sediment quality in publicly accessible areas in the vicinity of the northern confluence of Dumpling Brook and the Merrimack River

Golder collected sediment samples from three locations near the northern confluence of Dumpling Brook and the Merrimack River and an upstream location from a beach near the railroad bridge at the end of Moores Crossing Road in Bedford, New Hampshire. PFOA was not detected in any of the samples. The following PFAS were detected (J-flagged) at very low (i.e., less than 1 ng/g) concentrations in the most downstream sample location (SED-MERR-303W): PFTrDA (0.28J ng/g), PFTA (0.62J ng/g), and PFHxDA (0.4J ng/g). PFAS were not detected in any of the samples collected from the remaining three sample locations.

NHDES Request 2: Investigate water quality in the unnamed brook identified by NHDES to the north of facility

Golder collected two dry-weather samples and two wet-weather samples from two locations in the unnamed brook to the north of the facility (Unnamed Brook A). Golder also collected and one dry-weather sample from the unnamed brook at the northern end of the Flatley property (Unnamed Brook B).

Concentrations of PFOA in dry-weather samples collected from Unnamed Brook A ranged from 1,000 ng/L to 1,600 ng/L. PFOA was detected at a concentration of 2,700 ng/L in the one dry-weather surface water sample collected from Unnamed Brook B. The only other PFAS detected above 100 ng/L in dry-weather surface water samples from Unnamed Brooks A and B were PFPeA, PFHxA and PFHpA.

Concentrations of PFOA in wet-weather samples collected from Unnamed Brook A ranged from 310 ng/L to 1,300 ng/L. The only other PFAS detected above 100 ng/L in the Unnamed Brook A wet-weather surface water samples were PFPeA, PFHxA and PFHpA. A wet-weather sample was not collected from Unnamed Brook B.

6.0 PRELIMINARY CONCEPTUAL MODEL

The following presents preliminary conceptual models for stormwater and surface water based on the findings identified above and the findings presented in the 2017 StW-SW ISR, as well as consideration of the requests in

NHDES comments on the 2017 StW-SW ISR. Data generated during subsequent investigations may inform and modify these preliminary conceptual models.

Stormwater Conveyance System and Nearby Merrimack River - Dry-weather flow:

- PFAS were detected in samples collected from the facility stormwater conveyance system under dry-weather conditions.
- The source of PFAS in dry-weather flow at Outfall 001 is most likely groundwater infiltration into the stormwater conveyance system where portions of the conveyance system piping are at least periodically partially beneath the water table[5].
- Dry-weather flow that enters the Merrimack River at Outfall 001 is detected within the mixing zone at lower concentrations but does not result in a detectible increase in PFAS concentrations in Merrimack River surface water downstream of the mixing zone.

Stormwater Conveyance System and Nearby Merrimack River - Wet-weather flow:

- PFAS were detected in samples collected from the facility stormwater conveyance system under wet-weather conditions.
- The concentrations of PFAS in Outfall 001 under wet-weather first flush conditions were similar to concentrations detected under dry-weather conditions, and lower than PFAS concentrations detected upstream manhole samples (i.e., MH-5 and MH-23). First flush samples were collected following procedures specified by NHDES as outlined in the work plan. However, it is Golder's opinion that the first flush samples collected from Outfall 001 are not representative of stormwater conditions. The first flush samples collected in 2018 at Outfall 001 at the beginning of low-intensity storms are considered more representative of dry-weather flow that was not completely flushed from the stormwater conveyance system at the time of sample collection.
- PFAS concentrations were lower in the wet-weather samples collected later in the storm compared to the first flush samples; indicating that the concentrations observed under first flush conditions are not representative of PFAS concentrations during longer duration, higher intensity storm events.
- PFAS concentrations in samples collected from the Main Building roof drains are the highest concentrations detected during the wet-weather sampling events. Therefore, run-off from the north end of the Main Building and the New Manufacturing Building is considered the primary the source of higher PFAS detections in samples collected from MH-5 under wet-weather first flush conditions. However, PFAS were also detected in wet-weather samples collected from locations that do not receive flow from the roof drains, including the sample collected from Drainage-001, which receives stormwater flow from areas off and to the west of the SGPP property. Therefore, run-off from the building roofs is not the only source of PFAS in wet-weather stormwater flow. In addition to upgradient sources, the inflow of PFAS-impacted groundwater into the

[5] Some long-chain PFAS (perfluorotridecanoic acid [PFTriA], and perfluorotetradecanoic acid [PFTA]) were detected in dry-weather flow at concentrations less than 5 ng/L. These compounds are not commonly detected in facility groundwater, therefor the source of these compounds in dry weather is uncertain. One potential source of these compounds in dry weather flow is back diffusion from sediments within the stormwater conveyance system and/or stormwater conveyance system materials.

stormwater conveyance system is also a likely contributor of some the PFAS detected in wet-weather flow in the stormwater conveyance system, particularly during low intensity precipitation events.

- Wet-weather flow that enters the Merrimack River at Outfall 001 is detected within the mixing zone at lower concentrations but does not result in a detectible increase in PFAS concentrations in Merrimack River surface water downstream of the mixing zone.

Dumpling Brook:

- PFAS were detected in samples collected from Dumpling Brook under dry-weather and wet-weather conditions. PFAS concentrations in Dumpling Brook generally increase from upstream near Daniel Webster Highway to downstream near the confluence with the Merrimack River.
- Potential sources of PFAS detected in the upstream sampling location (Daniel Webster Highway) include aerially deposited PFAS from the facility (as described in the Preliminary Air, Soil, and Water Modeling Technical Memorandum: Merrimack, New Hampshire [Barr, 2017]) and/or other potential PFAS sources in the Dumpling Brook drainage basin upstream of Daniel Webster Highway.
- The potential cause of the observed increase in PFAS concentrations between Daniel Webster Highway and the confluence of Dumpling Brook and the Merrimack River include aerially deposited PFAS and/or the discharge of PFAS-impacted groundwater into the Brook, as is currently being evaluated as part of the Site Investigation report.
- PFAS is detected within the mixing zone of Dumpling Brook and the Merrimack River at lower concentrations than in Dumpling Brook. The PFAS detected in the mixing zone does not result in a detectible increase in PFAS concentrations in Merrimack River surface water downstream of the mixing zone.

Unnamed Brooks A and B:

- PFAS were detected in samples collected from Unnamed Brook A under both dry-weather and wet-weather conditions. PFAS were detected in Unnamed and B under dry-weather conditions (wet-weather samples were not collected from Unnamed Brook B).
- The potential sources of PFAS detected in both unnamed brooks include aerially deposited PFAS from the facility (Barr, 2017) and/or other potential PFAS sources in the brooks' drainage basins.

The results of stormwater and surface water investigations for PFAS and other constituents will be further evaluated in the Site Investigation report.

7.0 NHDES ROOF STORMWATER RUNOFF EVALUATION REQUEST

In a February 22, 2019 letter to SGPP, NHDES outlined the following observations based on data transmittals sent to NHDES:

- "Results of the roof drain sampling indicate initial first-flush stormwater from the roof surface contain highly elevated levels of PFAS that are an order of magnitude (or more) greater than the 70 ng/L [Ambient Groundwater Quality Standards (AGQS)] for PFOA and PFOS…"
- "Roof runoff containing elevated PFAS has the potential to contaminate groundwater via two potential pathways identified thus far:

- 1) Infiltration into the ground where water drips/flows off the roof onto the ground surface. This can occur where stormwater flows off the New Manufacturing Building roof onto broken pavement and grass.
- 2) Where exfiltration from the stormwater system potentially currently occurs and / or previously occurred in places where the infrastructure is / was cracked or otherwise compromised.”

As a result, NHDES requested an evaluation of remedial alternatives to address the potential for stormwater to impact groundwater. Specifically, NHDES requested:

> “*Saint-Gobain should provide an evaluation of remedial alternatives of stormwater designed to control this ongoing release of PFAS that has a high potential to contribute to PFAS contamination of groundwater. Examples of potential remedial alternatives include (but are not limited to) carbon-based stormwater filtration devices, roof / stormwater pipe cleaning, etc.”*

Golder and SGPP reviewed roof drainage at the facility and identified the following two areas around the New Manufacturing Building where water from the roof reaches the ground surface:

- In the southwestern corner of the New Manufacturing Building roof water discharges directly to the ground surface. SGPP proposes to evaluate installation of a gutter to redirect this portion of roof runoff to the New Manufacturing Building roof drain system which discharges to the stormwater conveyance system.
- Along the eastern edge of the New Manufacturing Building roof runoff flows to the stormwater conveyance system via exterior downspouts that discharge to the paved ground surface before flowing into to stormwater catch basins via surface flow over pavement. Golder observed areas of compromised pavement where overland flow could infiltrate into the subsurface between the downspouts and the catch basins. SGPP proposes to evaluate patching or sealing of areas of compromised pavement integrity between the downspouts and the catch basins to prevent potential infiltration.

In response to NHDES’ comments regarding potential exfiltration of stormwater to groundwater, SGPP is evaluating:

- installation of air emissions controls that would mitigate potential PFAS emissions and eliminate the potential for char to be deposited on the rooftop and enter stormwater flow.
- installation of roof drain filters to prevent materials from entering the roof drain system.
- cleaning or implementation of additional remedial measures, if needed, after implementation of air controls if Site Investigation activities indicate that stormwater exfiltration is causing groundwater impacts.

In addition, the following activities will be performed as part of the Site Investigation activities:

- Re-installation of the on-site rain gauge in the spring of 2019 (approximately late March 2019) to document precipitation trends through the spring, summer, fall and early winter of 2019.
- Continued stormwater conveyance system flow rate monitoring through 2019 using the flow meter installed downstream of manhole MH-29.
- Continued monitoring of groundwater elevations at monitoring well couplets MW-03 and MW-06 using the installed transducers.

- Monthly observation of dry-weather flow conditions (excluding winter months during snow cover) including observations at select stormwater catch basins, site drainage swales and Outfall 001 to document the presence or absence of dry-weather flow, and concurrent groundwater elevation monitoring.

While SGPP is willing to undertake the activities described above, it is premature to conclude that the potential, theoretical pathways as identified by NHDES have “a high potential to contribute to PFAS contamination of groundwater”. SGPP is currently evaluating the potential for exfiltration of stormwater from the conveyance network to cause impacts to groundwater as part of the Site Investigation activities. Specifically, the Site Investigation Work Plan (Golder, 2018) includes soil and groundwater investigations within or near PRA-16 which includes the potential for exfiltration of stormwater. In a letter dated August 28, 2018 NHDES acknowledged that “Exfiltration from the stormwater system will be evaluated during Site Investigation activities”. Whether exfiltration from stormwater is occurring, and whether it is a significant source of impacts in the context of air deposition is appropriately evaluated in the context of the data generated specifically to evaluate this as part of the Site Investigation activities. If it is concluded during the Site Investigation that remedial measures are required for one or more of these potential pathway(s), evaluation of remedial alternatives will be conducted as part of the Remedial Action Plan.

8.0 CLOSING

The undersigned are the principal authors of this Report. Should you have any questions regarding this document, please contact Ross Bennett at (603) 668-0880.

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NHDES, 2018a. Letter Re: Stormwater and Surface Water Investigation Summary Report. March 14, 2018.

NHDES, 2018b. Letter Re: Work Plan for 2018 Stormwater and Surface Water Investigation. April 13, 2018.

NHDES, 2018c. Letter Re: *On-Property Site Investigation Work Plan, On-Property Site Investigation Work Plan Addendum, Flatley Property Investigation*. August 20, 2018.

TABLES

Table 1: 2018 Monthly Total Precipitation and Historical Monthly Total Precipitation
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

	2018 SGPP Rain Gauge Monthly Total Precipitation (in)	2018 MHT Monthly Total Precipitation (in)	MHT Average Monthly Total Precipitation (in)
March	0.06*	2.39	4.33
April	4.84	4.12	3.86
May	1.03	0.85	4.05
June	3.50	4.99	3.79
July	2.28	5.70	3.80
August	5.57	6.71	3.63
September	7.32	7.53	3.81
October	3.10	3.10	4.16
November	7.77	8.82	4.07
December	1.93*	2.59	3.28

Notes:

1. MHT - Manchester-Boston Regional Airport
2. * Indicates partial monthly data. The SGPP rain gauge was installed on 3/27/2018 and removed on 12/21/2018.
3. MHT monthly total and average precipitation data received from weather.gov

Created by: LWL
Checked by: ERW
Reviewed by: APTM

Table 2: Dry-Weather Flow Observations Summary Table
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Event Date	Date of Preceding Rain Event	Days Since Preceding Rain Event[1]	Drainage West of Parking Lot (SGPP-Drainage-001)	Swale Upstream of CB-1 (SGPP-Drainage-002)	MH-23	MH-28	MH-5	MH-13	Outfall Flow Field Measurement (GPM)	Outfall Flow Meter Measurement (GPM)	MW-03S	MW-04	MW-04S	MW-05	MW-06	MW-06S	Additional Comments
4/10/2018	4/3/2018	7	Dry	Dry	Flow observed	Flow observed	Flow observed	Flow observed	7.94	6.47	177.57	176.3	176.02	176.02	171.85	171.05	
5/10/2018	5/6/2018	4	Dry	Dry	Flow observed	Flow observed	Flow observed	Flow observed	10.65	3.17	177.62	176.59	176.43	176.19	172.45	171.75	
6/22/2018	6/18/2018	4	Dry	Dry	Wet - no flow	Flow observed	Flow observed	Flow observed	2.55	2.52	176.35	175.02	175.31	174.15	171.14	170.74	
7/20/2018	7/17/2018	3	Dry	Dry	Flow observed	Flow observed	Flow observed	Flow observed	2.76	1.40	176.35	174.9	175.3	173.91	171.1	170.62	Groundwater level was not gauged in MW-01S due to access being blocked by a motor vehicle.
8/27/2018	8/22/2018	5	Dry	Dry	Flow observed	Flow observed	Flow observed	Flow observed	4.22	2.07	176.8	175.46	175.53	174.74	170.9	170.64	
10/19/2018	10/11/2018	8	Dry	Dry	Flow observed	Flow observed	Wet - no flow	Flow observed	1.00	1.44	NM	NM	NM	175.01	171.6	171.05	Groundwater levels were not gauged in MW-03, MW-03S, MW-04, and MW-04S due to access being blocked by motor vehicles.
11/15/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	178.78	176.96	176.65	176.7	172.87	171.97	Water levels observed as part of SI activities, dry weather observations not completed until 11/30/2018.
11/30/2018	11/27/2018	3	Dry	Flow observed	Flow observed	Flow observed	Flow observed	Flow observed	15.9	9.61	179.33	NM	177.34	NM	NM	172.66	Groundwater levels were only gauged in MW-03S, MW-04S, and MW-6S. Monitoring wells had previously been gauged on 11/15/2018.
12/12/2018	12/3/2018	9	Dry	Flow observed	Flow observed	Flow observed	Flow observed	Flow observed	10.6	4.9	178.75	177.45	177.21	176.78	173.45	172.81	Groundwater levels were gauged on 12/13/2018 as part of Site Investigation activities.
1/17/2019	1/9/2019	8	Dry	Flow observed	Flow observed	Flow observed	Flow observed	Flow observed	5.22	4.61	178.27	NM	NM	NM	NM	172.09	Groundwater levels were only gauged in MW-03S, MW-06S

Notes:
1. A rain event is defined as 0.25 inches or greater of rain measured by the site rain gauge and confirmed by local weather forecasting reports.
2. NM - not measured.

Prepared By: LWL
Checked By: ERW
Reviewed By: RWB

Table 3: Groundwater Elevation Monitoring Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Measurement Date	Reference Elevation (Top of PVC) (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
MW-01	03/28/2016	179.10	6.58	172.52
MW-01	04/18/2016	179.10	6.28	172.82
MW-01	02/01/2017	179.10	NM	-
MW-01	03/03/2017	179.10	6.75	172.35
MW-01	03/28/2017	179.10	6.25	172.85
MW-01	06/20/2017	179.10	4.01	175.09
MW-01	08/29/2017	179.10	5.48	173.62
MW-01	09/29/2017	179.10	5.70	173.40
MW-01	10/20/2017	179.10	6.08	173.02
MW-01	11/30/2017	179.10	5.71	173.39
MW-01	03/28/2018	179.10	NM	-
MW-01	04/06/2018	179.10	4.50	174.60
MW-01	05/10/2018	179.10	4.06	175.04
MW-01	06/06/2018	179.10	NM	-
MW-01	06/14/2018	179.10	4.98	174.12
MW-01	06/22/2018	179.10	5.21	173.89
MW-01	07/20/2018	179.10	4.79	174.31
MW-01	08/23/2018	179.10	4.82	174.28
MW-01	08/27/2018	179.10	4.82	174.28
MW-01	10/19/2018	179.10	4.98	174.12
MW-01	11/15/2018	179.10	3.72	175.38
MW-01	12/13/2018	179.10	3.23	175.87
MW-01S	03/28/2016	179.28	6.78	172.50
MW-01S	04/18/2016	179.28	6.52	172.76
MW-01S	02/01/2017	179.28	NM	-
MW-01S	03/03/2017	179.28	6.93	172.35
MW-01S	03/28/2017	179.28	6.40	172.88
MW-01S	06/20/2017	179.28	4.27	175.01
MW-01S	08/29/2017	179.28	NM	-
MW-01S	09/29/2017	179.28	5.94	173.34
MW-01S	10/20/2017	179.28	NM	-
MW-01S	11/30/2017	179.28	5.90	173.38
MW-01S	03/28/2018	179.28	NM	-
MW-01S	04/06/2018	179.28	4.78	174.50
MW-01S	05/10/2018	179.28	4.40	174.88
MW-01S	06/06/2018	179.28	NM	-
MW-01S	06/14/2018	179.28	5.24	174.04
MW-01S	06/22/2018	179.28	5.45	173.83
MW-01S	07/20/2018	179.28	NM	-
MW-01S	08/23/2018	179.28	4.95	174.33
MW-01S	08/27/2018	179.28	4.95	174.33
MW-01S	10/19/2018	179.28	5.24	174.04
MW-01S	11/15/2018	179.28	4.01	175.27
MW-01S	12/13/2018	179.28	3.50	175.78

Table 3: Groundwater Elevation Monitoring Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Measurement Date	Reference Elevation (Top of PVC) (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
MW-02	03/28/2016	183.24	7.12	176.12
MW-02	04/18/2016	183.24	6.81	176.43
MW-02	02/01/2017	183.24	8.42	174.82
MW-02	03/03/2017	183.24	7.56	175.68
MW-02	03/28/2017	183.24	7.20	176.04
MW-02	06/20/2017	183.24	4.92	178.32
MW-02	08/29/2017	183.24	6.86	176.38
MW-02	09/29/2017	183.24	6.91	176.33
MW-02	10/20/2017	183.24	7.41	175.83
MW-02	11/30/2017	183.24	6.75	176.49
MW-02	03/28/2018	183.24	NM	-
MW-02	04/06/2018	183.24	5.19	178.05
MW-02	05/10/2018	183.24	4.90	178.34
MW-02	06/06/2018	183.24	NM	-
MW-02	06/14/2018	183.24	6.14	177.10
MW-02	06/22/2018	183.24	6.44	176.80
MW-02	07/20/2018	183.24	6.61	176.63
MW-02	08/23/2018	183.24	6.03	177.21
MW-02	08/27/2018	183.24	6.03	177.21
MW-02	10/19/2018	183.24	6.00	177.24
MW-02	11/15/2018	183.24	4.36	178.88
MW-02	12/13/2018	183.24	3.91	179.33
MW-02S	03/28/2016	183.39	6.52	176.87
MW-02S	04/18/2016	183.39	7.16	176.23
MW-02S	02/01/2017	183.39	8.73	174.66
MW-02S	03/03/2017	183.39	8.07	175.32
MW-02S	03/28/2017	183.39	7.63	175.76
MW-02S	06/20/2017	183.39	5.13	178.26
MW-02S	08/29/2017	183.39	7.10	176.29
MW-02S	09/29/2017	183.39	7.18	176.21
MW-02S	10/20/2017	183.39	7.44	175.95
MW-02S	11/30/2017	183.39	7.08	176.31
MW-02S	03/28/2018	183.39	NM	-
MW-02S	04/06/2018	183.39	5.44	177.95
MW-02S	05/10/2018	183.39	5.12	178.27
MW-02S	06/06/2018	183.39	NM	-
MW-02S	06/14/2018	183.39	6.38	177.01
MW-02S	06/22/2018	183.39	6.69	176.70
MW-02S	07/20/2018	183.39	6.88	176.51
MW-02S	08/23/2018	183.39	6.37	177.02
MW-02S	08/27/2018	183.39	6.37	177.02
MW-02S	10/19/2018	183.39	6.28	177.11
MW-02S	11/15/2018	183.39	4.62	178.77
MW-02S	12/13/2018	183.39	4.02	179.37

Table 3: Groundwater Elevation Monitoring Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Measurement Date	Reference Elevation (Top of PVC) (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
MW-03	03/28/2016	182.75	6.74	176.01
MW-03	04/18/2016	182.75	6.48	176.27
MW-03	02/01/2017	182.75	8.17	174.58
MW-03	03/03/2017	182.75	7.18	175.57
MW-03	03/28/2017	182.75	7.87	174.88
MW-03	06/20/2017	182.75	5.10	177.65
MW-03	08/29/2017	182.75	6.69	176.06
MW-03	09/29/2017	182.75	6.72	176.03
MW-03	10/20/2017	182.75	7.11	175.64
MW-03	11/30/2017	182.75	6.19	176.56
MW-03	03/28/2018	182.75	5.17	177.58
MW-03	04/06/2018	182.75	5.07	177.68
MW-03	05/10/2018	182.75	5.02	177.73
MW-03	06/06/2018	182.75	5.90	176.85
MW-03	06/14/2018	182.75	6.09	176.66
MW-03	06/22/2018	182.75	6.41	176.34
MW-03	07/20/2018	182.75	6.39	176.36
MW-03	08/23/2018	182.75	5.88	176.87
MW-03	08/27/2018	182.75	5.88	176.87
MW-03	11/15/2018	182.75	3.92	178.83
MW-03	12/13/2018	182.75	3.98	178.77
MW-03S	03/28/2016	182.61	6.67	175.94
MW-03S	04/18/2016	182.61	6.36	176.25
MW-03S	02/01/2017	182.61	7.69	174.92
MW-03S	03/03/2017	182.61	6.98	175.63
MW-03S	03/28/2017	182.61	6.51	176.10
MW-03S	06/20/2017	182.61	5.08	177.53
MW-03S	08/29/2017	182.61	6.53	176.08
MW-03S	09/29/2017	182.61	6.53	176.08
MW-03S	10/20/2017	182.61	6.94	175.67
MW-03S	11/30/2017	182.61	6.30	176.31
MW-03S	03/28/2018	182.61	5.12	177.49
MW-03S	04/06/2018	182.61	5.04	177.57
MW-03S	05/10/2018	182.61	4.99	177.62
MW-03S	06/06/2018	182.61	5.79	176.82
MW-03S	06/14/2018	182.61	5.99	176.62
MW-03S	06/22/2018	182.61	6.26	176.35
MW-03S	07/20/2018	182.61	6.26	176.35
MW-03S	08/23/2018	182.61	5.81	176.80
MW-03S	08/27/2018	182.61	5.81	176.80
MW-03S	11/15/2018	182.61	3.83	178.78
MW-03S	11/30/2018	182.61	3.28	179.33
MW-03S	12/13/2018	182.61	3.86	178.75
MW-03S	01/17/2019	182.61	4.34	178.27

Table 3: Groundwater Elevation Monitoring Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Measurement Date	Reference Elevation (Top of PVC) (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
MW-04	03/28/2016	182.40	7.82	174.58
MW-04	04/18/2016	182.40	7.51	174.89
MW-04	02/01/2017	182.40	8.67	173.73
MW-04	03/03/2017	182.40	8.03	174.37
MW-04	03/28/2017	182.40	7.95	174.45
MW-04	06/20/2017	182.40	5.87	176.53
MW-04	08/29/2017	182.40	7.76	174.64
MW-04	09/29/2017	182.40	7.74	174.66
MW-04	10/20/2017	182.40	8.19	174.21
MW-04	11/30/2017	182.40	7.18	175.22
MW-04	03/28/2018	182.40	6.32	176.08
MW-04	04/06/2018	182.40	6.10	176.30
MW-04	05/10/2018	182.40	5.81	176.59
MW-04	06/06/2018	182.40	6.73	175.67
MW-04	06/14/2018	182.40	7.05	175.35
MW-04	06/22/2018	182.40	7.38	175.02
MW-04	07/20/2018	182.40	7.50	174.90
MW-04	08/23/2018	182.40	6.94	175.46
MW-04	08/27/2018	182.40	6.94	175.46
MW-04	11/15/2018	182.40	5.44	176.96
MW-04	12/13/2018	182.40	4.95	177.45
MW-04S	03/28/2016	182.33	8.11	174.22
MW-04S	04/18/2016	182.33	7.79	174.54
MW-04S	02/01/2017	182.33	8.92	173.41
MW-04S	03/03/2017	182.33	8.49	173.84
MW-04S	03/28/2017	182.33	8.15	174.18
MW-04S	06/20/2017	182.33	5.90	176.43
MW-04S	08/29/2017	182.33	7.31	175.02
MW-04S	09/29/2017	182.33	7.38	174.95
MW-04S	10/20/2017	182.33	7.84	174.49
MW-04S	11/30/2017	182.33	7.49	174.84
MW-04S	03/28/2018	182.33	6.47	175.86
MW-04S	04/06/2018	182.33	6.31	176.02
MW-04S	05/10/2018	182.33	5.90	176.43
MW-04S	06/06/2018	182.33	6.59	175.74
MW-04S	06/14/2018	182.33	6.79	175.54
MW-04S	06/22/2018	182.33	7.02	175.31
MW-04S	07/20/2018	182.33	7.03	175.30
MW-04S	08/23/2018	182.33	6.80	175.53
MW-04S	08/27/2018	182.33	6.80	175.53
MW-04S	11/15/2018	182.33	5.68	176.65
MW-04S	11/30/2018	182.33	4.99	177.34
MW-04S	12/13/2018	182.33	5.12	177.21

**Table 3: Groundwater Elevation Monitoring Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire**

Location	Measurement Date	Reference Elevation (Top of PVC) (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
MW-05	03/28/2016	182.27	7.58	174.69
MW-05	04/18/2016	182.27	7.58	174.69
MW-05	02/01/2017	182.27	8.84	173.43
MW-05	03/03/2017	182.27	8.40	173.87
MW-05	03/28/2017	182.27	8.05	174.22
MW-05	06/20/2017	182.27	6.58	175.69
MW-05	08/29/2017	182.27	8.81	173.46
MW-05	09/29/2017	182.27	8.59	173.68
MW-05	10/20/2017	182.27	9.01	173.26
MW-05	11/30/2017	182.27	8.32	173.95
MW-05	03/28/2018	182.27	NM	-
MW-05	04/06/2018	182.27	6.25	176.02
MW-05	05/10/2018	182.27	6.08	176.19
MW-05	06/06/2018	182.27	NM	-
MW-05	06/14/2018	182.27	7.66	174.61
MW-05	06/22/2018	182.27	8.12	174.15
MW-05	07/20/2018	182.27	8.36	173.91
MW-05	08/23/2018	182.27	7.53	174.74
MW-05	08/27/2018	182.27	7.53	174.74
MW-05	10/19/2018	182.27	7.26	175.01
MW-05	11/15/2018	182.27	5.57	176.70
MW-05	12/13/2018	182.27	5.49	176.78
MW-06	03/28/2016	182.60	14.02	168.58
MW-06	04/18/2016	182.60	13.66	168.94
MW-06	02/01/2017	182.60	15.24	167.36
MW-06	03/03/2017	182.60	14.75	167.85
MW-06	03/28/2017	182.60	14.30	168.30
MW-06	06/20/2017	182.60	10.63	171.97
MW-06	08/29/2017	182.60	12.15	170.45
MW-06	09/29/2017	182.60	12.14	170.46
MW-06	10/20/2017	182.60	12.59	170.01
MW-06	11/30/2017	182.60	12.12	170.48
MW-06	03/28/2018	182.60	10.90	171.70
MW-06	04/06/2018	182.60	10.75	171.85
MW-06	05/10/2018	182.60	10.15	172.45

Table 3: Groundwater Elevation Monitoring Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Measurement Date	Reference Elevation (Top of PVC) (ft msl)	Depth to Water (ft)	Water Elevation (ft msl)
MW-06	06/06/2018	182.60	10.96	171.64
MW-06	06/14/2018	182.60	11.11	171.49
MW-06	06/22/2018	182.60	11.46	171.14
MW-06	07/20/2018	182.60	11.50	171.10
MW-06	08/23/2018	182.60	11.05	171.55
MW-06	08/27/2018	182.60	11.70	170.90
MW-06	10/19/2018	182.60	11.00	171.60
MW-06	11/15/2018	182.60	9.73	172.87
MW-06	12/13/2018	182.60	9.15	173.45
MW-06S	03/28/2016	182.64	14.02	168.62
MW-06S	04/18/2016	182.64	14.42	168.22
MW-06S	02/01/2017	182.64	15.98	166.66
MW-06S	03/03/2017	182.64	15.64	167.00
MW-06S	03/28/2017	182.64	15.02	167.62
MW-06S	06/20/2017	182.64	11.33	171.31
MW-06S	08/29/2017	182.64	12.55	170.09
MW-06S	09/29/2017	182.64	12.58	170.06
MW-06S	10/20/2017	182.64	12.98	169.66
MW-06S	11/30/2017	182.64	12.50	170.14
MW-06S	03/28/2018	182.64	11.80	170.84
MW-06S	04/06/2018	182.64	11.59	171.05
MW-06S	05/10/2018	182.64	10.89	171.75
MW-06S	06/06/2018	182.64	11.50	171.14
MW-06S	06/14/2018	182.64	11.67	170.97
MW-06S	06/22/2018	182.64	11.90	170.74
MW-06S	07/20/2018	182.64	12.02	170.62
MW-06S	08/23/2018	182.64	11.70	170.94
MW-06S	08/27/2018	182.64	12.00	170.64
MW-06S	10/19/2018	182.64	11.59	171.05
MW-06S	11/15/2018	182.64	10.67	171.97
MW-06S	11/30/2018	182.64	9.98	172.66
MW-06S	12/13/2018	182.64	9.83	172.81
MW-06S	01/17/2019	182.64	10.55	172.09
MW-104B-49	11/15/2018	181.62	5.07	176.55
MW-104B-49	12/13/2018	181.62	4.94	176.68
MW-104B-49	01/17/2019	181.62	5.55	176.07
GZ-107	11/15/2018	181.48	11.36	170.12
GZ-107	12/13/2018	181.48	11.35	170.13
GZ-107	01/17/2019	181.48	12.49	168.99
GZ-107	02/05/2018	181.48	12.47	169.01

Notes:

1. Groundwater elevation data reported from March 2016 to June 2017 was collected by C.T. Male Associates. Groundwater elevation data reported after June 2017 were collected by Golder Associates, Inc.
2. NM - not measured

Prepared by: LWL
Checked by: RWB
Reviewed by: APTM

Table 4: 2018 Surface Water Sampling Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Sampling Event			Sample Date	Lab Report	Sampling Locations
2018 Quarter	**Event Type**	**Surface Water Location**			
Q2	Dry Weather Flow	Dumpling Brook	5/17/2018 & 5/24/2018	GOA17-04-1945663, GOA17-01BKG-1945489, GOA18-01-1948018	SW-DB-101, SW-DB-102, SW-DB-103, SW-DB-104, SW-DB-105, SW-DB-106, SW-DB-107, SW-DB-108, SW-DB-109
		Merrimack River	5/17/2018 & 5/24/2018	GOA17-04-1945663, GOA17-01BKG-1945489, GOA18-01-1948018	SW-MERR-101W-NS, SW-MERR-201W-NS, SW-MERR-201W-IC, SW-MERR-202W-NS, SW-MERR-202W-IC, SW-MERR-301W-NS, SW-MERR-302W-NS, SW-MERR-302W-IC, SW-MERR-303W-NS, SW-MERR-401W-NS, SW-MERR-402W-NS, SW-MERR-402W-IC, SW-MERR-403W-NS
		SGPP Facility	5/24/2018	GOA18-01-1948018	SGPP-Outfall 001, SGPP-MH-5, SGPP-MH-23
		Unnamed Brook A	5/18/2018	GOA16-01-1945487	SW-UBA-101, SW-UBA-102, DUP-1, EB-1, FB-1, TB-1
		QA/QC Samples (Not including Unnamed Brook)	5/17/2018 & 5/24/2018	GOA17-04-1945663, GOA17-01BKG-1945489, GOA18-01-1948018	DUP-1, DUP-2, EB-1, EB-2, FB-1, TB-1, SW-DB-107 MS, SW-DB-107 MSD
	Wet Weather Flow	Dumpling Brook	6/5/2018	GOA22-01-1951644	SW-DB-101, SW-DB-102, SW-DB-103, SW-DB-104, SW-DB-105, SW-DB-106, SW-DB-107, SW-DB-108, SW-DB-109
		Merrimack River	6/4/2018 - 6/5/2018	GOA20-01-1951005, GOA22-01-1951644	SW-MERR-101W-NS, SW-MERR-201W-NS, SW-MERR-201W-IC, SW-MERR-202W-NS, SW-MERR-202W-IC, SW-MERR-301W-NS, SW-MERR-302W-NS, SW-MERR-302W-IC, SW-MERR-303W-NS, SW-MERR-401W-NS, SW-MERR-402W-NS, SW-MERR-402W-IC, SW-MERR-403W-NS
		SGPP Facility	6/4/2018	GOA20-01-1951005	SGPP-Outfall-001, SGPP-MH-5, SGPP-MH-23
		Unnamed Brook A	6/4/2018	GOA21-01-1951024	SW-UBA-101, SW-UBA-102, DUP-1, EBA1, FBA1, TBA1
		QA/QC Samples (Not including Unnamed Brook)	6/4/2018 - 6/5/2018	GOA20-01-1951005, GOA22-01-1951644	DUP-1, DUP-2, EB-1, EB-2, FB-1, FB-2, TB-1, TB-2, SW-DB-101 MS, SW-DB-101 MSD
Q3	Dry-Weather Flow	Dumpling Brook	8/28/2018	GOA27-1982040	SW-DB-101, SW-DB-102, SW-DB-103, SW-DB-104, SW-DB-105, SW-DB-106, SW-DB-107, SW-DB-108, SW-DB-109
		Merrimack River	8/21/2018 & 8/28/2018	GOA25-1979205, GOA27-1982040	SW-MERR-101W-NS, SW-MERR-201W-NS, SW-MERR-201W-IC, SW-MERR-202W-NS, SW-MERR-202W-IC, SW-MERR-301W-NS, SW-MERR-302W-NS, SW-MERR-302W-IC, SW-MERR-303W-NS, SW-MERR-401W-NS, SW-MERR-402W-NS, SW-MERR-402W-IC, SW-MERR-403W-NS
		SGPP Facility	8/21/2018	GOA25-1979205	SGPP-Outfall-001, SGPP-MH-5, SGPP-MH-23
		QA/QC Samples	8/21/2018 & 8/28/2018	GOA25-1979205, GOA27-1982040	DUP-1, DUP-2, EB-1, EB-2, FB-1, TB-1, TB-2, SW-MERR-202W-NS MS, SW-MERR-202W-NS MSD
	Wet Weather Event	Dumpling Brook	10/2/2018	GOA48 - 1840074 (A), GOA48 - 1994826	SW-DB-101, SW-DB-102, SW-DB-103, SW-DB-104, SW-DB-105, SW-DB-106, SW-DB-107, SW-DB-108, SW-DB-109
		Merrimack River	9/10/2018 & 10/2/2018	GOA29-19827, GOA48 - 1840074 (A), GOA48 - 1994826	SW-MERR-101W-NS, SW-MERR-201W-NS, SW-MERR-201W-IC, SW-MERR-202W-NS, SW-MERR-202W-IC, SW-MERR-301W-NS, SW-MERR-302W-NS, SW-MERR-302W-IC, SW-MERR-303W-NS, SW-MERR-401W-NS, SW-MERR-402W-NS, SW-MERR-402W-IC, SW-MERR-403W-NS
		SGPP Facility	9/10/2018	GOA29 - 198297, GOA29 - L1835977 (A)	SGPP-Outfall-001,SGPP-Outfall-001, SGPP-MH-5, SGPP-MH-5, SGPP-MH-5 Centrifuge, SGPP-MH-23, SGPP-MH-23, SGPP-MH-23 Centrifuge, SGPP-RD-MB-NW, SGPP-RD-MB-NE, SGPP-RD-MB-SW, SGPP-RD-MB-SE, SGPP-RD-NMB, SGPP-DI-34
		SGPP Facility	9/25/2018	GOA33 - 1991864	SGPP-Outfall-001, SGPP-MH-5, SGPP-MH-23, SSGPP-Drainage-001 , SGPP-Drainage-002
		Unnamed Brook A	10/2/2018	GOA49 - 1994827, GOA49- 1840072(A)	SW-UBA-101 , SW-UBA-102, FB-1 , EB-1 , DUP-1
		QA/QC Samples (Not including Unnamed Brook)	9/10/2018, 9/25/2018 & 10/2/2018	GOA29 - 198297, GOA29 - 1835977 (A), GOA33 - 1991864, GOA48 - 1840074 (A), GOA48 - 1994826	DUP-1, DUP-2, EB-1, EB-1, EB-2, FB-1, FB-1, FB-2, TB-1, TB-2, TB-1, SW-DB-106 MS, SW-DB-106 MSD, SGPP-Outfall-001 MS, SGPP-Outfall-001MSD
Q4	Dry Weather Flow	Dumpling Brook	11/30/2018	GOA57 - 2014190, GOA57 - L1849096 (A)	SW-DB-101, SW-DB-103, SW-DB-104, SW-DB-105, SW-DB-106, SW-DB-107, SW-DB-108, SW-DB-109
		Merrimack River	11/30/2018 & 12/6/2018	GOA57 - 2014190, GOA57 - L1849096 (A), GOA61 - 2016744, GOA61 -L1850120 (A)	SW-MERR-101W-NS, SW-MERR-201W-NS, SW-MERR-201W-IC, SW-MERR-202W-NS, SW-MERR-301-NS
		SGPP Facility	12/6/2018	GOA61 - 2016744, GOA61 -L1850120 (A)	SGPP-Outfall-001, SGPP-MH-5, SGPP-MH-23
		Unnamed Brook A	12/6/2018	GOA60 - 2016743	SW-UBA-101, SW-UBA-102
		Unnamed Brook B	12/6/2018	GOA59 - 2016742	SW-UBB-101
		QA/QC Samples (Not including Unnamed Brook)	11/30/2018 & 12/6/2018	GOA57 - 2014190, GOA57 - L1849096 (A), GOA61 - 2016744, GOA61 - L1850120 (A)	DUP-1, DUP-2, EB-1, EB-2, FB-1, FB-2, TB-1, TB-2, SW-DB-106 MS, SW-DB-106 MSD, SW-MERR-201W-ICMS, SW-MERR-201W-ICMSD
	Wet Weather Flow	Dumpling Brook	11/2/2018	GOA47 - L1845049 (A), GOA47 - 2005540	SW-DB-101, SW-DB-102, SW-DB-103, SW-DB-104, SW-DB-105, SW-DB-106, SW-DB-107, SW-DB-108, SW-DB-109
		Merrimack River	11/2/2018 & 11/13/2018	GOA47 - L1845049 (A), GOA47 - 2005540, GOA51 - 2009382, GOA51 - L1846472 (A)	SW-MERR-101W-NS, SW-MERR-201W-NS, SW-MERR-201W-IC, SW-MERR-202W-NS, SW-MERR-202W-IC, SW-MERR-301W-NS, SW-MERR-402W-NS, SW-MERR-403W-NS
		SGPP Facility	11/13/2018	GOA51 - 2009382, GOA51 - L1846472 (A)	SGPP-Outfall 001, SW-SGPP-MH-5, SGPP-MH-23
		QA/QC Samples (Not including Unnamed Brook)	11/2/2018 & 11/13/2018	GOA47 - L1845049 (A), GOA47 - 2005540, GOA51 - 2009382, GOA51 - L1846472 (A), GOA52 - 2009682	DUP-1, DUP-2, EB-2, EB-2, FB-1, FB-2, Trip Blank, CB-24, DI-17, SW-DB-106 MS, SW-DB-106 MSD

Prepared by: JTF
Checked by: MJS
Reviewed by: RWB

Table 5: PFAS Surfacewater Dry-Weather Anlaytical Results
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

			CAS No. - Analysis Name	375-22-4 - Perfluorobutanoic acid (PFBA)	2706-90-3 - Perfluoropentanoic acid (PFPeA)	307-24-4 - Perfluorohexanoic acid (PFHxA)	375-85-9 - Perfluoroheptanoic acid (PFHpA)	335-67-1 - Perfluorooctanoic acid (PFOA)	375-95-1 - Perfluorononanoic acid (PFNA)	335-76-2 - Perfluorodecanoic acid (PFDA)	2058-94-8 - Perfluoroundecanoic Acid (PFUnA)	307-55-1 - Perfluorododecanoic acid (PFDoA)	72629-94-8 - Perfluorotridecanoic Acid (PFTrIA)	376-06-7 - Perfluorotetradecanoic acid (PFTA)	67905-19-5 - Perfluorohexadecanoic acid	16517-11-6 - Perfluorooctadecanoic acid	375-73-5 - Perfluorobutanesulfonic acid (PFBS)	2706-91-4 - Perfluoropentanesulfonic acid (PFPeS)	355-46-4 - Perfluorohexanesulfonic acid (PFHxS)	375-92-8 - Perfluoroheptanesulfonic acid (PFHPS)	1763-23-1 - Perfluorooctanesulfonic acid (PFOS)	68259-12-1 - Perfluorononanesulfonic acid (PFNS)	335-77-3 - Perfluorodecane sulfonic acid (PFDS)	79780-39-5 - Perfluorododecane sulfonic acid (PFDoDS)	757124-72-4 - 4:2 Fluorotelomer sulfonic acid	27619-97-2 - 6:2 Fluorotelomer sulfonic acid	39108-34-4 - 8:2 Fluorotelomer sulfonic acid	120226-60-0 - 10:2 Fluorotelomer sulfonic acid	2991-50-6 - NEtFOSAA	2355-31-9 - NMeFOSAA	1691-99-2 - 2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	24448-09-7 - 2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	4151-50-2 - N-ethyl perfluoro-1-octanesulfonamide	31506-32-8 - N-methyl perfluoro-1-octanesulfonamide	754-91-6 - PFOSA	13252-13-6 - 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3-heptafluoropropoxy)
Location	Sample Date	Sample Type	Validated (Y/N)	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
MH-23	5/24/18 11:40	N	Y	150	320 J	420	250 J	1600	59	20	7.6	5.9	2.6	1.8			1.5 J		5 J		160								10	0.92 U						
	8/21/18 11:50	N	Y	170	300	400	340	3400	130	4.8	0.92 J	1.7 J	1.3	3	1.4		1.7	0.93 J	10	3	180					0.9 U			1.4 J	0.9 U	1.1 U				0.67 J	2.1 J
	12/6/18 11:30	N	Y	94	190	270	190	1700	95	13	1.3 J	1.1 J	0.64 J	0.42 J	0.26 U		3.8	3.6	17	1.5 J	180					0.87 U			0.87 U	0.87 U	1 U				0.58 J	1.6 J
MH-5	5/24/18 11:35	N	Y	140	540	740	360 J	2000	14	4.8	1.9	3.4	3	3.7			6 J		16 J		73								3.6	0.89 U						
	8/21/18 11:55	N	Y	130	400	650	370	2800	21	4.7	0.95 J	1.3 J	0.98	1	0.26 U		5.5	4.4	18	1.6 J	68					16			1.8 J	0.87 U	1 U				0.61 J	1.9 J
	12/6/18 11:35	N	Y	130	350	520	320 J	2100	27	7.2	1.3 J	1.3 J	0.43 J	0.42 J	0.26 U		4.7 J	3.1 J	13	1.4 J	78					2			0.85 U	0.85 U	1 U				0.43 U	1.9 J
OUTFALL 001	11/29/17 16:35	N	Y	160	560	720	420	2700	18	5	2	5	2	2			6		21		60 J								15 J	0.9 U						
	5/24/18 10:15	N	Y	160	530	760	400	2100	17 J	10 J	4.8 J	6.1 J	2.8 J	2.7 U	2.7 U	2.7 U	7.8 J	7 J	20	3.6 U	110	5.5 U	5.5 U	2.7 U	9.1 UJ	86	18 U	27 U	9.4 J	9.1 U	9.1 U	9.1 U	27 U	27 U	9.1 U	1.5 J
	8/21/18 9:10	N	Y	130	410	580	390	2700	26	5.8	2.2	4.2	2.3	1.9	0.26 U		5.7	4.8	17	1.7 J	83					65			9.4	0.86 U	1.4 J				2.3 J	1.8 J
	12/6/18 13:00	N	Y	170	530	730	590	3300	57	30	6.2 J	4.3 U	3.4 U	2.6 U	2.6 U		8.7	12 J	45	12 J	850					84			130	8.5 U	10 U				5 J	4.3 U
SW-DB-101	11/29/17 0:00	N	Y	31	120	150	97	640	10	6	0.7 U	0.5 U	0.5 U	0.5 U			7		12		75								2 U	2 U						
	5/17/18 10:15	N	Y	29 J	100	140	85	530	5.1 J	9 U	3.6 U	2.7 U	2.7 U	2.7 U			6.7 J		9.9 J		25								9 U	9 UJ						
	5/24/18 13:25	N	Y	30	110 J	160	90 J	630	5.3	2.1	0.36 U	0.27 U	0.27 U	0.27 U			7.8 J		11 J		31								0.91 U	0.91 U						
	8/28/18 9:00	N	Y	32	130	180	94	570	6.1	2 J	0.67 U	0.83 U	0.67 U	0.5 U	0.5 U		8.1	3.9	11	0.97 J	37					7.7			1.7 U	1.7 U	2 U				0.83 U	0.5 U
	11/30/18 9:40	N	Y	1.7 U	1.7 U	0.96 J	0.71 J	3.6	0.34 U	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.56 J	0.34 U	0.39 J	0.34 U	1.3 UB					0.86 UJ			0.86 U	0.86 UJ	1 U				0.43 U	0.43 U
SW-DB-102	11/29/17 12:40	N	Y	5 U	10 J	14	8	45	1 J	2 U	1 U	0.7 U	0.7 U	0.7 U			1 J		1 J		4 J								2 U	2 U						
	5/24/18 13:25	N	Y	5.3 J	22 J	29	17	100	0.74 J	0.91 U	0.36 U	0.27 U	0.27 U	6.5			2 J		2.4		5.9								0.91 U	0.91 UJ						
	8/28/18 10:15	N	Y	18	72	87	52	290	2.6 J	1.5 U	0.67 U	0.83 U	0.67 U	0.5 U	0.5 U		4.3	2 J	6.1	0.67 U	17					3.3 J			1.7 U	1.7 U	2 U				0.83 U	0.5 U
SW-DB-103	11/29/17 15:00	N	Y	29	110	140	93	480	8	3	0.5 U	0.4 U	0.4 U	0.4 U			7		11		38								1 U	1 U						
	5/17/18 14:25	N	Y	23 J	86	110	68	460	4.9 J	8.8 U	3.5 U	2.6 U	2.6 U	2.6 U			7 J		8.5 J		23								8.8 U	8.8 U						
	8/28/18 12:15	N	Y	30	120	160	85	490	6.3	2.2	0.36 U	0.45 U	0.36 U	0.27 U	0.27 U		8.2	3	12	0.93 J	35					8.6			0.9 U	0.9 U	1.1 R				0.75 J	
	11/30/18 9:00	N	Y	17	61	96	54	310	3.5	1.7 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		5	2.2	6.4	0.36 J	21					3.4			0.86 U	0.86 UJ	1 U				1.5 J	0.43 U
SW-DB-104	5/17/18 16:00	N	Y	20 J	75	98	62	420	4.7 J	8.8 U	3.5 U	2.6 U	2.6 U	2.6 U			6.9 J		7.6 J		22								8.8 U	8.8 U						
	8/28/18 13:15	N	Y	29	120	150	85	440	6.6	3.1	0.34 U	0.42 U	0.34 U	0.25 U	0.25 U		8.1	2.9	12	0.85 J	43					11			0.85 U	0.85 U	1 R				0.42 R	
	11/30/18 9:30	N	Y	20	74	110	65	330	3.9	1.3 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		6.9	3	8.6	0.54 J	22					5.6			0.85 U	0.85 U	1 U				0.57 J	0.45 J
SW-DB-105	5/17/18 14:50	N	Y	21 J	77	100	61	380	4.7 J	8.9 U	3.5 U	2.7 U	2.7 U	2.7 U			6.7 J		6.7 J		23								8.9 U	8.9 U						
	8/28/18 13:55	N	Y	27	100	130	74	410	6.3	2.6	0.35 U	0.44 U	0.35 U	0.26 U	0.26 U		7.5	2.8	9.7	0.77 J	35					13			0.88 U	0.88 U	1.1 R				0.44 R	
	11/30/18 10:55	N	Y	19	70	110	60	350	3.6	1.3 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		7.1	2.7	7.4	0.39 J	20					4.3			0.86 U	0.86 UJ	1 U				1.3 J	0.44 J
SW-DB-106	5/17/18 0:00	N	Y	20 J	70	95	58	360	4.4 J	8.7 U	3.5 U	2.6 U	2.6 U	2.6 U			6.9 J		6.6 J		21								8.7 U	8.7 U						
	8/28/18 13:15	N	Y	25	100	140	78	460	5.7	2.4	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		7	2.6	8.9	0.87 J	30					9.5			0.86 U	0.86 U	1 U				0.49 J	
	11/30/18 11:30	FD	Y	18	66	96	59	350	3.6	1.3 J	0.36 U	0.45 U	0.36 U	0.27 U	0.27 U		6.3	2.4	6.6	0.45 J	18					4.8 J			0.91 U	0.91 UJ	1.1 UJ				1.6 J	0.45 UJ
	11/30/18 11:30	N	Y	18	68	96	56	360	3.6	1.3 J	0.37 U	0.46 U	0.37 U	0.27 U	0.27 U		6.3	2.5	6.7	0.45 J	17					5.7 J			0.91 U	0.91 U	1.1 UJ				0.49 J	0.55 J
SW-DB-107	5/18/18 8:30	N	Y	16 J	46	82	51	330	2.3 J	0.92 J	0.35 U	0.27 U	0.27 U	0.27 U			6.4 J		6.5		13 J								0.89 U	0.89 U						
	8/28/18 14:00	N	Y	17	55	90	52	270	3.4	1.3 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		6	2.2	7.3	0.46 J	19					4			0.85 U	0.85 U	1 R				0.43 R	
	11/30/18 10:50	N	Y	14	44	75	48	320	2.5	0.83 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		5.4	2.3	5.8	0.34 U	13					2.3			0.86 U	0.86 U	1 U				0.43 U	0.43 U
SW-DB-108	5/18/18 8:55	N	Y	9.2	23	45	38	240	1.5 J	0.92 U	0.37 U	0.28 U	0.28 U	0.28 U			5.5		6.1		6.9								0.92 U	0.92 U						
	8/28/18 14:25	N	Y	11	26	45	35	250	1.7 J	1.5 U	0.67 U	0.83 U	0.67 U	0.5 U	0.5 U		5.3	1.9 J	6	0.67 U	8.3					1.7 U			1.7 U	1.7 U	2 U				0.83 U	0.26 U
	11/30/18 11:20	N	Y	7.6	18	36	29	190	1.2 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		4.6	1.9	5.7	0.34 U	5.6					0.85 UJ			0.85 U	0.85 UJ	1 U				0.43 U	0.43 U
SW-DB-109	11/30/17 8:34	N	Y	7 J	16	30	32	180	0.9 J	2 U	0.7 U	0.5 U	0.5 U	0.5 U			5		4		4 J								2 U	2 U						
	5/18/18 9:10	N	Y	8	18	37	33	210	0.91 J	0.91 U	0.36 U	0.27 U	0.27 U	0.27 U			5.6		5.6		6								0.91 U	0.91 U						
	8/28/18 14:40	N	Y	8.9	21	39	32	210	1.1 J	0.78 U	0.35 U	0.43 U	0.35 U	0.26 U	0.26 U		5.4	1.7 J	5.5	0.35 U	6.4					0.87 U			0.87 U	0.87 U	1 R				1.2 J	
	11/30/18 12:25	N	Y	6.3	15	31	27	190	1 J	0.76 U	0.34 U	0.42 U	0.34 U	0.25 U	0.25 U		4.6	2	5.4	0.34 U	5.4					0.85 UJ			0.85 U	0.85 UJ	1 U				0.42 U	0.42 U
SW-MERR-101W-IC	11/30/17 9:30	N	Y	3 U	3 U	2 J	1 J	4	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U			0.7 J		0.7 U		0.9 J								2 U	2 U						
SW-MERR-101W-NS	11/30/17 9:25	N	Y	3 U	3 U	2 J	1 J	4	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U			0.5 J		0.7 U		1 J								2 U	2 UJ						
	5/24/18 8:55	N	Y	1.8 U	2 J	2.5 J	1.5 J	7.2 J	0.62 J	0.92 U	0.37 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.88 J	0.37 UJ	0.68 J	0.37 U	1.3 J	0.55 U	0.55 U	0.27 U	0.92 UJ	8.7 J	1.8 U	2.7 U	0.92 U	0.92 U	0.92 R	0.92 R	2.7 R	2.7 UJ	0.92 R	0.28 U
	5/24/18 8:55	FD	Y	2.4 J	8.1 J	9 J	5.9 J	22 J	0.4 J	0.92 U	0.39 J	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.93 J	0.37 UJ	0.76 J	0.37 U	2.5	0.55 U	0.55 U	0.28 U	0.92 UJ	1.4 J	1.8 U	2.8 U	0.92 U	0.92 U	0.92 R	0.92 R	2.8 R	2.8 UJ	0.92 R	0.29 U
	8/21/18 10:25	N	Y	2.1 J	2.1 J	1.4 J	1.3	3.6	0.54 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.79 J	0.34 U	0.55 J	0.34 U	1.5 J					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.74 UJ
	12/6/18 13:45	N	Y	1.8 U	1.8 U	1.1 J	0.9	3	0.35 U	0.79 U	0.35 U	0.44 U	0.35 U	0.26 U	0.26 U		0.54 J	0.35 UJ	0.42 J	0.35 U	0.74 J					0.88 U			0.88 U	0.88 U	1.1 U				1.4 J	0.44 U
SW-MERR-201W-IC	11/29/17 16:10	N	Y	3 U	3 U	2 J	1 J	4	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U			0.7 J		0.7 U		0.8 J								2 U	2 U						
	5/24/18 9:45	N	Y	3.6 J	9.9	12	6.2	29	0.49 J	0.92 U	0.37 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.97 J	0.37 UJ	0.9 J	0.37 U	2.4	0.55 U	0.55 U	0.28 U	0.92 UJ	1.7 J	1.8 U	2.8 U	0.92 U	0.92 U	0.92 R	0.92 UJ	2.8 R	2.8 UJ	0.92 UJ	0.29 U
	8/21/18 10:15	N	Y	2 J	2.7 J	2	1.7	4.9	0.57 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.64 J	0.34 U	0.6 J	0.34 U	1.9					0.85 U			0.85 U	0.85 U	1 U				0.43 U	0.74 U
	12/6/18 13:45	FD	Y	1.7 U	3.3 J	4.2 J	3.3 J	14 J	0.44 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.61 J	0.34 UJ	0.59 J	0.34 U	2.9 J					0.86 U			0.86 U	0.86 U	1 U				1 J	0.43 U
	12/6/18 13:45	N	Y	2.6 J	6.6 J	8.9 J	6.7 J	37 J	0.77 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.64 J	0.34 UJ	0.74 J	0.34 U	7.2 J					1.3 J			1.2 J	0.85 U	1 U				0.49 J	0.43 U
SW-MERR-201W-NS	11/29/17 16:10	N	Y	3 U	3 U	2 J	2 J	4	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U			0.7 J		0.7 U		2 J								2 U	2 U						
	11/29/17 16:10	FD	Y	3 R	3 R	2 J	2 J	4 J	0.7 R	2 R	0.7 R	0.5 R	0.5 R	0.5 R			0.6 J		0.7 R		1 J								2 R	2 R						
	5/24/18 8:55	N	Y	9.1	24 J	28	17	54	0.69 J	1.8 J	1.5 J	0.27 U	0.27 U	0.56 J	0.27 U	0.27 U	0.97 J	0.51 J	1.2 J	0.36 U	7.2	0.55 U	0.55 U	0.27 U	0.91 UJ	6 J	1.8 U	2.7 U	0.91 U	0.91 U	0.91 R	0.91 R	2.7 R	2.7 UJ	1.6 J	0.3 U
	8/21/18 9:35	N	Y	2.8 J	5.2	4.8	3.2	14 J	0.68 J	0.77 U	0.37 J	0.43 U	0.34 U	0.26 U	0.26 U		0.69 J	0.34 U	0.66 J	0.34 U	3.6					2.6			0.85 U	0.85 U	1 U				0.43 U	0.75 U
	8/21/18 9:35	FD	Y	2.4 J	3.6 J	3.1	2.2	8.7 J	0.54 J	0.78 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.75 J	0.34 U	0.58 J	0.34 U	2.4					1.4 J			0.86 U	0.86 U	1 U				0.43 U	0.74 U
	12/6/18 13:25	N	Y	5.8	17	23	16	91	1.8	1.2 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U		0.72 J	0.41 J	1.3 J	0.34 U	21					3.1			2.9	0.85 U	1 U				0.67 J	0.43 U
SW-MERR-202W-IC	11/29/17 15:30	N	Y	3 U	3 U	1 J	0.9 J	2 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U			0.6 J		0.7 U		1 J								2 U	2 U						
	5/24/18 10:00	N	Y	1.8 U	1.8 UJ	1.2 J	0.72 J	2.5	0.36 U	0.91 U	0.36 U	0.27 U	0.27 U	0.27 U			0.68 J		0.53 J		2.3								0.91 U	0.91 U						
	8/21/18 9:25	N	Y	2 J	2.2 J	1.7 J	1.2	2.8	0.5 J	0.79 U	0.35 U	0.44 U	0.35 U	0.26 U	0.26 U		0.8 J	0.35 U	0.65 J	0.35 U	1.6 J					0.88 U			0.88 U	0.88 U	1.1 U				0.44 U	0.75 U
SW-MERR-202W-NS	11/29/17 15:30	N	Y	3 U	3 U	1 J	1 J	2 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U			0.7 J		0.7 U		1 J								2 U	2 U						
	5/24/18 9:50	N	Y	1.8 U	1.8 UJ	1.2 J	0.68 J	2.5	0.36 U	0.9 U	0.36 U	0.27 U	0.27 U	0.27 U			0.7 J		0.54 J		1 J								0.9 U	0.9 U						
	8/21/18 9:15	N	Y	2.1 J	2.4 J	1.5 J	1.1	2.9	0.48 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 UJ		0.67 J	0.34 U	0.47 J	0.34 U	1.7 J					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.74 U
	12/6/18 13:00	N	Y	1.8 U	1.8 U	1 J	0.63 J	2.7	0.36 U	0.81 U	0.36 U	0.45 U	0.36 U	0.27 U	0.27 U		0.53 J	0.36 UJ	0.37 J	0.36 U	0.84 J					0.9 U			0.9 U	0.9 U	1.1 U				0.45 U	0.45 U

Table 5: PFAS Surfacewater Dry-Weather Anlaytical Results
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Sample Date	Sample Type	Validated (Y/N)	375-22-4 - Perfluorobutanoic acid (PFBA)	2706-90-3 - Perfluoropentanoic acid (PFPeA)	307-24-4 - Perfluorohexanoic acid (PFHxA)	375-85-9 - Perfluoroheptanoic acid (PFHpA)	335-67-1 - Perfluorooctanoic acid (PFOA)	375-95-1 - Perfluorononanoic acid (PFNA)	335-76-2 - Perfluorodecanoic acid (PFDA)	2058-94-8 - Perfluoroundecanoic Acid (PFUnA)	307-55-1 - Perfluorododecanoic acid (PFDoA)	72629-94-8 - Perfluorotridecanoic Acid (PFTriA)	376-06-7 - Perfluorotetradecanoic acid (PFTA)	67905-19-5 - Perfluorohexadecanoic acid	16517-11-6 - Perfluorooctadecanoic acid
				ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
SW-MERR-301W-IC	11/29/17 14:00	N	Y	3 U	3 U	1 J	0.8 J	2 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
	11/29/17 14:00	FD	Y	3 U	3 U	1 J	0.9 J	4	0.7 U	2 J	0.7 U	0.5 U	0.5 U	0.5 U		
SW-MERR-301W-NS	11/29/17 14:00	N	Y	3 U	3 U	1 J	0.8 J	2 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
	5/24/18 13:00	N	Y	1.8 U	1.8 UJ	1.3 J	0.7 J	2.6	0.36 U	0.91 U	0.36 U	0.27 U	0.27 U	0.27 U		
	5/24/18 13:00	FD	Y	1.8 UJ	1.8 UJ	1.3 J	0.65 J	2.4 J	0.36 UJ	0.91 UJ	0.36 U	0.27 UJ	0.27 UJ	0.27 UJ		
	8/28/18 10:30	N	Y	2 U	2.6 J	1.9 J	1.3	3.3	0.58 J	0.91 U	0.4 U	0.5 U	0.4 U	0.3 U	0.3 U	
	11/30/18 9:05	N	Y	1.7 U	1.7 U	0.73 J	0.69 J	2.1	0.34 U	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-MERR-302W-IC	11/29/17 13:20	N	Y	10 J	35	46	29	180	2 J	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
	5/24/18 14:00	N	Y	1.8 U	2 J	1.9	0.93	4.4	0.37 U	0.91 U	0.37 U	0.27 U	0.27 U	0.27 U		
	8/28/18 9:25	N	Y	1.9 U	2.9 J	2.6	1.8	5.7	0.45 J	0.88 U	0.39 U	0.49 U	0.39 U	0.29 U	0.29 U	
SW-MERR-302W-NS	11/29/17 13:05	N	Y	28	110	130	90	540	6	2 J	0.7 U	0.5 U	0.5 U	0.5 U		
	5/24/18 13:45	N	Y	1.8 U	1.9 J	1.8 J	1	4.7	0.36 U	0.9 U	0.36 U	0.27 U	0.27 U	0.27 U		
	8/28/18 9:10	N	Y	2 J	3 J	2.2	1.4	4.9	0.48 J	0.86 U	0.38 U	0.48 U	0.38 U	0.29 U	0.29 U	
	8/28/18 9:10	FD	Y	2 J	3.1 J	2.5	1.6	5.6	0.48 J	0.87 U	0.39 U	0.48 U	0.39 U	0.29 U	0.29 U	
SW-MERR-303W-IC	11/29/17 12:50	N	Y	3 U	3 U	1 J	0.9 J	3 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 UJ		
SW-MERR-303W-NS	11/29/17 12:40	N	Y	3 U	3 U	1 J	1 J	3 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 UJ		
	5/24/18 14:10	N	Y	1.8 U	2 J	1.7 J	0.87 J	4.3	0.37 U	0.91 U	0.37 U	0.27 U	0.27 U	0.27 U		
	8/28/18 8:20	N	Y	2 J	2.9 J	2.4	1.6	5.3	0.52 J	0.83 U	0.37 U	0.46 U	0.37 U	0.28 U	0.28 U	
SW-MERR-401W-IC	11/29/17 12:00	N	Y	3 U	3 U	2 J	1 J	4	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
SW-MERR-401W-NS	11/29/17 12:05	N	Y	5 U	5 U	1 J	1 J	3 UB	1 U	2 U	1 U	0.7 U	0.7 U	0.7 U		
	5/24/18 13:00	N	Y	1.8 U	2.1 J	1.7 J	0.98	5	0.37 U	0.91 U	0.37 U	0.27 U	0.27 U	0.27 U		
	8/28/18 10:30	N	Y	2 U	2.9 J	2.7	2.4	7.1	0.51 J	0.92 U	0.41 U	0.51 U	0.41 U	0.31 U	0.31 U	
SW-MERR-402W-IC	11/29/17 10:24	N	Y	3 U	5 J	4	3	17	0.7 U	2 J	0.7 U	0.5 U	0.5 U	0.5 U		
	5/17/18 13:25	N	Y	1.8 U	2.2 J	2.8	1.8	7.5	0.35 U	0.88 U	0.35 U	0.26 U	0.26 U	0.26 U		
	8/28/18 12:10	N	Y	6.3 J	19	23	14	74	0.97 J	1.5 U	0.67 U	0.83 U	0.67 U	0.5 U	0.5 U	
SW-MERR-402W-NS	11/29/17 10:24	N	Y	3 U	6 J	7	5	26	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
	5/17/18 13:15	N	Y	1.8 U	2.5 J	3.3	1.8	8.2	0.37 U	0.91 U	0.37 U	0.27 U	0.27 U	0.3 J		
	8/28/18 11:55	N	Y	10	36	47	27	160	1.5 J	1.5 U	0.67 U	0.83 U	0.67 U	0.5 U	0.5 U	
SW-MERR-403W-IC	11/29/17 9:45	N	Y	3 U	3 U	1 J	0.9 J	3 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
SW-MERR-403W-NS	11/29/17 9:45	N	Y	3 U	3 U	2 J	1 J	3 UB	0.7 U	2 U	0.7 U	0.5 U	0.5 U	0.5 U		
	5/17/18 13:00	N	Y	1.8 U	2.1 J	2.5	1.5	6	0.36 U	0.9 U	0.36 U	0.27 U	0.27 U	0.27 U		
	8/28/18 11:45	N	Y	3.3 U	4.6 J	5.6	3.1	14	0.67 U	1.5 U	0.67 U	0.83 U	0.67 U	0.5 U	0.5 U	
SW-UBA-101	5/18/18 10:15	FD	Y	35 J	100	170	150	1600	6.6 J	9.1 U	3.7 U	2.7 U	2.7 U	2.7 U		
	5/18/18 10:15	N	Y	32 J	100	190	160	1500	5.6 J	8.8 U	3.5 U	2.6 U	2.6 U	2.6 U		
	12/6/18 14:55	N	Y	24	76	160	130 J	1200	6.7	1.5 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-UBA-102	5/18/18 9:35	N	Y	53 J	130	200	140	1200	10 J	12 U	5 U	3.7 U	3.7 U	3.7 U		
	12/6/18 15:50	N	Y	30	86	190	140	1000	11	4	0.73 J	0.44 U	0.35 U	0.26 U	0.26 U	
SW-UBB-101	12/6/18 14:30	N	Y	64	210	330	250 J	2700	8.8	1.2 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	

Location	Sample Date	375-73-5 - Perfluorobutanesulfonic acid (PFBS)	2706-91-4 - Perfluoropentanesulfonic acid (PFPeS)	355-46-4 - Perfluorohexanesulfonic acid (PFHxS)	375-92-8 - Perfluoroheptanesulfonic acid (PFHPS)	1763-23-1 - Perfluorooctanesulfonic acid (PFOS)	68259-12-1 - Perfluorononanesulfonic acid (PFNS)	335-77-3 - Perfluorodecane sulfonic acid (PFDS)	79780-39-5 - Perfluorododecane sulfonic acid (PFDoDS)	757124-72-4 - 4:2 Fluorotelomer sulfonic acid	27619-97-2 - 6:2 Fluorotelomer sulfonic acid	39108-34-4 - 8:2 Fluorotelomer sulfonic acid	120226-60-0 - 10:2 Fluorotelomer sulfonic acid	2991-50-6 - NEtFOSAA	2355-31-9 - NMeFOSAA	1691-99-2 - 2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	24448-09-7 - 2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	4151-50-2 - N-ethyl perfluoro-1-octanesulfonamide	31506-32-8 - N-methyl perfluoro-1-octanesulfonamide	754-91-6 - PFOSA	13252-13-6 - 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3-heptafluoropropoxy
		ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
SW-MERR-301W-IC	11/29/17 14:00	0.7 J		0.7 U		1 J								2 U	2 U						
	11/29/17 14:00	0.7 J		0.7 J		1 J								2 U	2 U						
SW-MERR-301W-NS	11/29/17 14:00	0.6 J		0.7 U		1 J								2 U	2 U						
	5/24/18 13:00	0.72 J		0.55 J		0.93 J								0.91 U	0.91 U						
	5/24/18 13:00	0.72 J		0.51 J		1 J								0.91 UJ	0.91 UJ						
	8/28/18 10:30	0.9 J	0.4 U	0.83 J	0.4 U	2.1					1 U			1 U	1 U	1.2 U				0.56 J	0.26 U
	11/30/18 9:05	0.6 J	0.34 U	0.39 J	0.34 U	0.89 UB					0.85 UJ			0.85 U	0.85 UJ	1 U				0.43 U	0.43 U
SW-MERR-302W-IC	11/29/17 13:20	2		3		13 J								2 U	2 U						
	5/24/18 14:00	0.76 J		0.67 J		1.2 J								0.91 U	0.91 U						
	8/28/18 9:25	0.83 J	0.39 U	0.75 J	0.39 U	1.8 J					0.97 U			0.97 U	0.97 U	1.2 U				0.49 U	0.26 U
SW-MERR-302W-NS	11/29/17 13:05	7		10		37 J								2 U	2 U						
	5/24/18 13:45	0.73 J		0.55 J		1.2 J								0.9 U	0.9 U						
	8/28/18 9:10	0.74 J	0.38 U	0.71 J	0.38 U	1.9 J					0.95 U			0.95 U	0.95 U	1.1 U				0.59 J	0.5 U
	8/28/18 9:10	0.85 J	0.39 U	0.83 J	0.39 U	1.8 J					0.97 U			0.97 U	0.97 U	1.2 U				0.48 U	0.26 U
SW-MERR-303W-IC	11/29/17 12:50	0.5 J		0.7 U		1 J								2 U	2 U						
SW-MERR-303W-NS	11/29/17 12:40	0.7 J		0.7 U		1 J								2 U	2 U						
	5/24/18 14:10	0.7 J		0.57 J		1.2 J								0.91 U	0.91 U						
	8/28/18 8:20	0.9 J	0.37 U	0.82 J	0.37 U	1.8 J					0.92 U			0.92 U	0.92 U	1.1 U				0.55 J	0.26 U
SW-MERR-401W-IC	11/29/17 12:00	0.7 J		0.7 U		1 J								2 U	2 U						
SW-MERR-401W-NS	11/29/17 12:05	0.7 U		1 U		1 J								2 U	2 U						
	5/24/18 13:00	0.74 J		0.64 J		1.3 J								0.91 U	0.91 U						
	8/28/18 10:30	2.4	0.41 U	0.9 J	0.41 U	2.6					1 U			1 U	1 U	1.2 U				0.51 U	0.26 U
SW-MERR-402W-IC	11/29/17 10:24	0.9 J		0.9 J		2 J								2 U	2 U						
	5/17/18 13:25	0.94		0.67 J		1.4 J								0.88 U	0.88 U						
	8/28/18 12:10	1.6 J	0.67 U	2.1 J	0.67 U	4.9					1.7 U			1.7 U	1.7 U	2 U				0.83 U	0.5 U
SW-MERR-402W-NS	11/29/17 10:24	0.9 J		0.8 J		2 J								2 U	2 U						
	5/17/18 13:15	0.94 J		0.73 J		1.9								0.91 U	0.91 U						
	8/28/18 11:55	2.5	0.67 U	3.6	0.67 U	9.2					1.7 J			1.7 U	1.7 U	2 U				0.83 U	0.5 U
SW-MERR-403W-IC	11/29/17 9:45	0.6 J		0.7 U		1 J								2 U	2 U						
SW-MERR-403W-NS	11/29/17 9:45	0.7 J		0.7 U		1 J								2 U	2 U						
	5/17/18 13:00	0.86 J		0.64 J		1.3 J								0.9 U	0.9 U						
	8/28/18 11:45	0.87 J	0.67 U	0.9 J	0.67 U	1.9 J					1.7 U			1.7 U	1.7 U	2 U				0.83 U	0.26 U
SW-UBA-101	5/18/18 10:15	5.1 J		8.8 J		16 J								9.1 U	9.1 U						
	5/18/18 10:15	5.3 J		8.6 J		16 J								8.8 U	8.8 U						
	12/6/18 14:55	5.7 J	2.5 J	8.3	0.41 J	18					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.59 J
SW-UBA-102	5/18/18 9:35	9.4 J		6.8 J		30								12 U	12 U						
	12/6/18 15:50	8.7 J	2.4 J	7.4	0.63 J	29					0.87 U			0.87 U	0.87 U	1 U				0.44 U	1 J
SW-UBB-101	12/6/18 14:30	5.5 J	3 J	16 J	0.69 J	27					0.86 U			0.86 U	0.86 U	1 U				0.43 U	1.2 J

Notes:
Abbreviations

B = Concentration was identified in the blank sample and normal sample
FD = Field duplicate sample
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
N = Normal (primary) sample
ng/l = nanograms per liter
R = Rejected
U = The analyte was analyzed for, but was not detected above the level of the reported sample method detection limit (MDL).

Prepared by: ESI
Checked by: MLS
Reviewed by: RWB

Table 6: PFAS Surfacewater Wet-Weather Analytical Results Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

				CAS No. - Analysis Name	375-22-4 - Perfluorobutanoic acid (PFBA)	2706-90-3 - Perfluoropentanoic acid (PFPeA)	307-24-4 - Perfluorohexanoic acid (PFHxA)	375-85-9 - Perfluoroheptanoic acid (PFHpA)	335-67-1 - Perfluorooctanoic acid (PFOA)	375-95-1 - Perfluorononanoic acid (PFNA)	335-76-2 - Perfluorodecanoic acid (PFDA)	2058-94-8 - Perfluoroundecanoic Acid (PFUnA)	307-55-1 - Perfluorododecanoic acid (PFDoA)	72629-94-8 - Perfluorotridecanoic Acid (PFTriA)	376-06-7 - Perfluorotetradecanoic acid (PFTA)	67905-19-5 - Perfluorohexadecanoic acid	16517-11-6 - Perfluorooctadecanoic acid
Location	Sample Date	Sample Type	First Flush? (Y/N)	Validated (Y/N)	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
CB-24	11/13/18 9:40	N	N	Y	2.3 J	3.6 J	6.3	2.5	9.5	0.57 J	2.7	6.8	9.9	4.5	1.6	0.29 U	
DI-17	11/13/18 10:00	N	N	Y	2.1 J	1.9 U	1 J	0.75 J	4.5	0.38 U	0.86 U	1.7 J	3.4	1.7	0.96	0.29 U	
DI-34	9/10/18 18:20	N	Y	Y	120	200	430	200	880	54	130	60	75	20	11	1.5 U	
MH-23	11/16/17 18:45	N	N	Y	51	110	370	260	200	13	23	11	16	10	11		
MH-23	6/4/18 6:05	N	Y	Y	250	560	1100	360 J	860	44	67	26	21	7.9 J	6.5 J		
MH-23	9/10/18 18:05	N	Y	Y	250	500	710	470	1400	75	55	33	23	8.7	6.7	1.5 U	
MH-23	9/10/2018 19:12 (Uncentrifuged)	N	N	Y	360	650	1300	730	1000	65	62	32	30	13	11	2.6 U	
MH-23	9/10/2018 19:12 (Centrifuged)	N	N	Y	370	1200	1900	1100	3000	58	49	20	16	6.5	4	1.4 J	
MH-23	9/25/18 12:05	N	Y	Y	160	300	660	350	870	33	28	13	11	4.7	2	0.34 J	
MH-23	11/13/18 7:10	N	N	Y	11	15	25	14	61	0.98 J	1.4 J	1.3 J	2	0.93	0.66 J	0.26 U	
MH-5	11/16/2017 7:15 PM	FD	N	Y	540 J	820 J	2100 J	1900 J	7900 J	72 J	110 J	56 J	74 J	38 J	32 J		
MH-5	11/16/2017 7:15 PM	N	N	Y	280 J	530 J	1100 J	930 J	4100 J	41 J	60 J	24 J	25 J	8 J	8 J		
MH-5	6/4/18 5:50	N	Y	Y	830	1500	4600	2000 J	7600	240	390	98	83	27	23		
MH-5	9/10/2018 4:40 PM	N	Y	Y	1300	2200	8200	3200	12000	230	320	100	97	40	29	7.5 J	
MH-5	9/10/2018 7:20:00 PM (Uncetrifuged)	N	N	Y	1200 J	2200 J	4900 J	2800 J	7500 J	190 J	220 J	85 J	90 J	51 J	34	11	
MH-5	9/10/2018 7:20:00 PM (Centrifuged)	N	N	Y	2300	4000	13000	5300	20000	350	350	130	110	45	21	3.1	
MH-5	9/25/18 17:35	N	N	Y	90	190	390	660	1700	20	38	16	14	5.1	2.3	0.37 J	
MH-5	11/13/18 7:00	N	N	Y	52	86	190	150	1200	8.4 J	12 J	3.5 J	4.2 U	3.4 U	2.5 U	2.5 U	
OUTFALL 001	6/4/18 5:50	N	Y	Y	160	500	730	430	2200	23	9.9	4.6	7.4	4.1	3	0.69 J	0.27 U
OUTFALL 001	9/10/18 17:05	N	Y	Y	140	490	740	420	2500	16	3.4	1.2 J	2.4	2.4	3.5	1.1	
OUTFALL 001	9/10/18 19:15	N	N	Y	1400	2800	5600	3100	7900	170	180	58	57	27 J	20 J	4.8 J	
OUTFALL 001	9/10/18 19:15	FD	N	Y	1800	3000	6500	3700	9400	190	180	51	42	12 J	7.1 J	2 J	
OUTFALL 001	11/13/18 7:55	N	N	Y	30 J	48 J	99	65	470	5 J	7.7 U	3.4 U	4.3 U	3.4 U	2.6 U	2.6 U	
RD-MB-NE	9/10/18 17:42	N	Y	Y	10000	17000	39000	28000	52000	570	390	170	150	61	44	10	
RD-MB-NW	9/10/18 17:37	N	Y	Y	5900	9700	23000	7800	11000	470	480	190	180	80	66	15	
RD-MB-SE	9/10/18 17:58	N	Y	Y	1100	2100	3400	1600	1400	72	65	24	17	6.7	5.4	1.7 J	
RD-MB-SW	9/10/18 17:25	N	Y	Y	1300	1900	3900	2100	1400	87	81	35	28	9.4	5.7	1.5 U	
RD-NMB	9/10/18 15:18	N	Y	Y	1700	2400	6600	11000	4300	220	290	83	43	14	6.5	1.6 J	
SGPP-DRAINAGE-001	9/25/18 16:10	N	Y	Y	12	20	38	30	110	0.97 J	1.1 J	0.53 J	0.61 J	0.39 U	0.3 U	0.3 U	
SGPP-DRAINAGE-002	9/25/18 16:35	N	Y	Y	4.3 J	5.9	11	19	14	1 J	2	1.4 J	1.3 J	0.39 U	0.29 U	0.29 U	
SW-DB-101	6/5/18 9:10	N	NA	Y	33	120	160	69	490	5.6	1.9	0.36 U	0.27 U	0.27 U	0.27 U		
SW-DB-101	10/2/18 11:05	N	NA	Y	26	96	130	68	420	4.5	1.4 J	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-101	11/2/18 9:55	N	NA	Y	2.5 U	2.5 U	1.1 J	0.71 J	2.4	0.5 U	1.1 U	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-102	6/5/18 9:25	N	NA	Y	41	180	240	110	650	5.2	0.95 U	0.38 U	0.29 U	0.29 U	0.29 U		
SW-DB-102	10/2/18 9:50	N	NA	Y	1.9 J	3.2 J	4.5	2.9	13	0.44 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-DB-102	11/2/18 10:05	N	NA	Y	3 J	7.3	10	5.5	38	0.63 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-DB-103	6/5/18 12:05	N	NA	Y	30	110	160	66	490	6	2.2	0.38 U	0.28 U	0.28 U	0.28 U		
SW-DB-103	10/2/18 11:20	N	NA	Y	26	96	140	70	440	4.9	1.8	0.35 U	0.44 U	0.35 U	0.26 U	0.26 U	
SW-DB-103	11/2/18 10:45	N	NA	Y	22	78	110	61	340	4	1.9	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-DB-104	6/5/18 12:30	N	NA	Y	28	100	150	70	420	5.3	2.2	0.38 U	0.28 U	0.28 U	0.28 U		
SW-DB-104	10/2/18 12:10	N	NA	Y	23	89	130	69	360	4.5	1.6 J	0.35 U	0.44 U	0.35 U	0.26 U	0.26 U	
SW-DB-104	11/2/18 11:30	N	NA	Y	20	71	96	55	330	4.4	2.1	0.34 J	0.42 U	0.34 U	0.25 U	0.25 U	
SW-DB-105	6/5/18 12:55	N	NA	Y	28	100	130	69	390	5.3	2.6	0.37 U	0.28 U	0.28 U	0.28 U		
SW-DB-105	10/2/18 16:40	N	NA	Y	23	85	120	63	400	4.1	1.7	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-DB-105	11/2/18 11:35	N	NA	Y	21	71	100	46	310	3.8	1.6 J	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-106	6/5/18 13:10	N	NA	Y	29	100	140	67	410	5.6	2.6	0.37 U	0.28 U	0.28 U	0.28 U		
SW-DB-106	10/2/18 16:20	N	NA	Y	22	84	120	61	360	3.9	1.7 J	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-106	10/2/18 16:20	FD	NA	Y	20	75	100	56	350	3.6	1.3 J	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-106	11/2/18 12:00	N	NA	Y	18	58	87	44	280	3.4	1.3 J	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-106	11/2/18 12:00	N	NA	Y	19	63	94	48	290	3.4	1.2 J	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-107	6/5/18 12:45	N	NA	Y	18	50	88	50	320	2.4	0.93 U	0.37 U	0.28 U	0.28 U	0.28 U		
SW-DB-107	10/2/18 16:30	N	NA	Y	15	47	74	43	230	2.6	0.87 U	0.39 U	0.48 U	0.39 U	0.29 U	0.29 U	
SW-DB-107	11/2/18 13:20	N	NA	Y	13	36	59	38	250	2.2	0.88 J	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-DB-108	6/5/18 12:15	N	NA	Y	14	32	62	39	260	1.5 J	0.91 U	0.37 U	0.27 U	0.27 U	0.27 U		
SW-DB-108	10/2/18 16:50	N	NA	Y	8.5	21	41	32	190	1.1 J	0.91 U	0.4 U	0.5 U	0.4 U	0.3 U	0.3 U	
SW-DB-108	11/2/18 13:40	N	NA	Y	8.7	17	32	23	160	1.3 J	1.1 U	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-109	6/5/18 13:10	N	NA	Y	8.9	19	39	29	220	0.94 J	0.91 U	0.36 U	0.27 U	0.27 U	0.27 U		
SW-DB-109	10/2/18 17:10	N	NA	Y	7.9	17	31	26	170	0.9 J	1.1 U	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-DB-109	11/2/18 13:03	N	NA	Y	5.6	10	18	16	110	0.82 J	0.78 U	0.35 U	0.43 U	0.35 U	0.26 U	0.26 U	
SW-MERR-101W-IC	11/16/17 17:30	N	NA	Y	3 U	1 J	2 J	2 J	3	0.5 U	0.7 U	0.7 U	0.5 U	0.5 U	0.5 U		
SW-MERR-101W-NS	11/16/17 17:20	N	NA	Y	5 U	2 J	2 J	1 J	4	0.7 U	1 U	1 U	0.7 U	0.7 U	0.7 U		
SW-MERR-101W-NS	6/4/18 7:10	N	NA	Y	2 U	3.4 J	4.6	2.5	9.4 J	0.39 U	0.98 U	0.39 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
SW-MERR-101W-NS	6/4/18 7:10	N	NA	Y	2 U	3.3 J	4.4	2.4	9.3 J	0.39 U	0.98 U	0.39 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
SW-MERR-101W-NS	9/10/18 18:05	N	NA	Y	2 J	3 J	4.1	2.4 UB	7.1 UB	0.63 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-MERR-101W-NS	11/13/18 8:45	N	NA	Y	1.7 U	1.7 U	1 J	0.68 J	3.3	0.34 U	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-MERR-201W-IC	11/16/17 16:05	N	N	Y	3 U	1 J	1 J	1 J	3	0.5 U	0.7 U	0.7 U	0.5 U	0.5 U	0.5 U		
SW-MERR-201W-IC	6/4/18 6:15	N	Y	Y	21	49	84	39	220 J	6	6.4	2.7	2.9	1.3	1.3	0.38 J	0.29 U
SW-MERR-201W-IC	9/10/18 17:30	N	Y	Y	1.9 J	2.8 J	3.2	2 UB	7.1 UB	0.47 J	0.78 U	0.35 U	0.43 U	0.35 U	0.26 U	0.26 U	
SW-MERR-201W-IC	11/13/18 8:50	N	N	Y	1.7 U	1.7 U	1.3 J	1	3.8	0.34 U	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-MERR-201W-NS	11/16/17 15:55	N	N	Y	5 U	6	9	7	22	0.7 U	1 U	1 U	0.7 U	0.7 U	0.7 U		
SW-MERR-201W-NS	6/4/18 6:10	N	Y	Y	8.2	28	32	19	79 J	1.2 J	1.6 J	1.1 J	0.6 J	0.51 J	0.89 J	0.32 J	0.3 U
SW-MERR-201W-NS	9/10/18 17:15	N	Y	Y	31	100	98	54	350	5.3	6.6	3.7	9.2	3.1	2.3	0.26 U	
SW-MERR-201W-NS	11/13/18 8:35	N	N	Y	2 J	3.5 J	5.3 J	3.4 J	21 J	0.54 J	1.2 J	0.64 J	1 J	0.34 U	0.26 U	0.26 U	
SW-MERR-201W-NS	11/13/18 8:35	FD	N	Y	4.2 J	6.8	13 J	8 J	63 J	0.92 J	1.4 J	0.65 J	0.96 J	0.38 J	0.3 J	0.26 U	

			375-73-5 - Perfluorobutanesulfonic acid (PFBS)	2706-91-4 - Perfluoropentanesulfonic acid (PFPeS)	355-46-4 - Perfluorohexanesulfonic acid (PFHxS)	375-92-8 - Perfluoroheptanesulfonic acid (PFHPS)	1763-23-1 - Perfluorooctanesulfonic acid (PFOS)	68259-12-1 - Perfluorononanesulfonic acid (PFNS)	335-77-3 - Perfluorodecane sulfonic acid (PFDS)	79780-39-5 - Perfluorododecane sulfonic acid (PFDoDS)	757124-72-4 - 4:2 Fluorotelomer sulfonic acid	27619-97-2 - 6:2 Fluorotelomer sulfonic acid	39108-34-4 - 8:2 Fluorotelomer sulfonic acid	120226-60-0 - 10:2 Fluorotelomer sulfonic acid	2991-50-6 - NEtFOSAA	2355-31-9 - NMeFOSAA	1691-99-2 - 2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	24448-09-7 - 2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	4151-50-2 - N-ethyl perfluoro-1-octanesulfonamide	31506-32-8 - N-methyl perfluoro-1-octanesulfonamide	754-91-6 - PFOSA	13252-13-6 - 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid
Location	Sample Date	Sample Type	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
CB-24	11/13/18 9:40	N	0.29 U	0.39 U	0.39 U	0.39 U	6.6					1.8 J			4.7	0.97 U	1.2 U				0.97 J	0.49 U
DI-17	11/13/18 10:00	N	0.29 U	0.38 U	0.38 U	0.38 U	1.2 J					0.95 U			0.95 U	0.95 U	1.1 U				0.48 U	0.48 U
DI-34	9/10/18 18:20	N	6.5	3.7 J	17	5.2 J	790					260			51	5 U	12 J				61	24
MH-23	11/16/17 18:45	N	0.5 J		2 J		64								9	0.4 U						
MH-23	6/4/18 6:05	N	3 U		7.7 J		200								35	9.9 U						
MH-23	9/10/18 18:05	N	6.2	3.8 J	15	5 J	460					97			20	4.9 U	5.9 U				7.6 J	4.6 J
MH-23	9/10/2018 19:12 (Uncentrifuged)	N	8.6	6.2 J	26	9.7 J	750					250			23 J	8.5 U	10 U				4.3 U	6.9
MH-23	9/10/2018 19:12 (Centrifuged)	N	7.6 J	6.1 J	23	7.6	1100					240			15	3.9 J	2 U				6.4	4.7
MH-23	9/25/18 12:05	N	2.6	1.8 J	8.5	2.4	180					120 J			14	0.98 U	1.2 U				5.3	5.1
MH-23	11/13/18 7:10	N	0.26 J	0.34 U	0.34 U	0.34 U	3.8					2.5			1.5 J	0.85 U	1 U				0.43 U	0.43 U
MH-5	11/16/2017 7:15 PM	FD	17 J		46 J		690 J								36 J	0.4 U						
MH-5	11/16/2017 7:15 PM	N	8 J		21 J		320 J								18 J	0.7 U						
MH-5	6/4/18 5:50	N	8.7 J		45		1100								21 J	9.9 U						
MH-5	9/10/2018 4:40 PM	N	50	38	140	33	2200					13000			47	8.7 U	10 U				23 J	110
MH-5	9/10/2018 7:20:00 PM (Uncetrifuged)	N	23 J	19 J	80 J	21 J	1900 J					2700 J			35 J	0.88 UJ	26				31	67
MH-5	9/10/2018 7:20:00 PM (Centrifuged)	N	41 J	29 J	150	35	4200					14000			24	1.7 U	21				59	77
MH-5	9/25/18 17:35	N	2.1	2.2	10	2.6	280					700			9.2	0.98 U	5.1				8.2	1.7 J
MH-5	11/13/18 7:00	N	2.5 U	3.4 U	3.4 J	3.4 U	47					190			8.5 U	8.5 U	10 U				4.2 U	4.2 U
OUTFALL 001	6/4/18 5:50	N	8	6.6	21	2.5	140	0.54 U	0.54 U	0.27 U	0.91 UJ	50 J	1.8 U	2.7 U	16	0.91 U	1.3 J	0.91 UJ	2.7 UJ	2.7 UJ	5.3 J	2.3 J
OUTFALL 001	9/10/18 17:05	N	5.8	4.5	16	1.3 J	53 J					26			5.7	0.86 U	1 U				1.1 J	1.7
OUTFALL 001	9/10/18 19:15	N	51 J	32 J	130	16	1600					8100			29	0.86 U	12 J				17	57
OUTFALL 001	9/10/18 19:15	FD	52	40	140	25	1800					8800			20	5 U	6 UJ				18	41
OUTFALL 001	11/13/18 7:55	N	2.6 U	3.4 U	3.4 U	3.4 U	38					72			8.5 U	8.5 U	10 U				4.3 U	4.3 U
RD-MB-NE	9/10/18 17:42	N	540 J	310 J	1000	90	6300					89000			70	4.9 U	56				63	92
RD-MB-NW	9/10/18 17:37	N	30 J	17 J	86	14	900					14000			16	5 U	6.6 J				7 J	150
RD-MB-SE	9/10/18 17:58	N	22 J	16 J	56	15	930					610			12 J	4.9 U	5.9 U				5.9 J	10
RD-MB-SW	9/10/18 17:25	N	1.5 UJ	2 UJ	14	4.3 J	320					490			4.9 U	4.9 U	6.3 J				3.2 J	36
RD-NMB	9/10/18 15:18	N	29	24	130	44	2200					9200			4.9 U	4.9 U	5.9 J				20	23
SGPP-DRAINAGE-001	9/25/18 16:10	N	0.95 J	0.39 U	0.98 J	0.39 U	3.5					0.99 U			0.99 U	0.99 U	1.2 U				0.49 U	0.49 UJ
SGPP-DRAINAGE-002	9/25/18 16:35	N	0.29 U	0.39 U	0.39 U	0.39 U	8.7					1.6 J			0.98 U	0.98 U	1.2 U				0.61 J	0.49 U
SW-DB-101	6/5/18 9:10	N	8.1		11		28								0.91 U	0.91 U						
SW-DB-101	10/2/18 11:05	N	6	2.6	8.9	0.6 J	26					8.9			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-101	11/2/18 9:55	N	0.55 UB	0.5 U	0.5 U	0.5 U	1.3 J					1.2 U			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-102	6/5/18 9:25	N	8.3		17		48								0.95 U	0.95 U						
SW-DB-102	10/2/18 9:50	N	0.76 J	0.34 U	0.69 J	0.34 U	1.7					0.85 U			0.85 U	0.85 U	4.3				0.67 J	0.43 U
SW-DB-102	11/2/18 10:05	N	0.99 UB	0.34 U	0.86 J	0.34 U	2.9					0.92 J			0.86 U	0.86 U	1 U				0.43 U	0.43 UJ
SW-DB-103	6/5/18 12:05	N	8.4		11		32								0.95 U	0.95 U						
SW-DB-103	10/2/18 11:20	N	6.6	2.8	8.7	0.57 J	28					8.5			0.88 U	0.88 U	1.1 U				0.44 U	0.44 U
SW-DB-103	11/2/18 10:45	N	5.4	2.3	7.5	0.64 J	24					7			0.85 U	0.85 U	1 U				0.43 U	0.51 J
SW-DB-104	6/5/18 12:30	N	8.3		11		32								0.94 U	0.94 U						
SW-DB-104	10/2/18 12:10	N	6.4	2.7	8.5	0.63 J	26					7.7			0.87 U	0.87 U	1 U				0.44 U	0.44 U
SW-DB-104	11/2/18 11:30	N	5.3	2.3	6.7	0.61 J	24					5.9			0.85 U	0.85 U	1 U				0.42 U	0.42 UJ
SW-DB-105	6/5/18 12:55	N	7.8		8.6		29								0.92 U	0.92 U						
SW-DB-105	10/2/18 16:40	N	6.8	2.5	7	0.48 J	23					8.5			0.86 U	0.86 U	1 U				0.43 U	0.43 U
SW-DB-105	11/2/18 11:35	N	5.2	1.8 J	4.8	0.5 U	19					5.5			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-106	6/5/18 13:10	N	8.4		8.6		30								0.93 U	0.93 U						
SW-DB-106	10/2/18 16:20	N	6.4	2.4 J	6.5	0.5 U	22					10			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-106	10/2/18 16:20	FD	5.3	2.1 J	6.4	0.5 U	20					9.2			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-106	11/2/18 12:00	N	5.4	1.9 J	4.8	0.5 U	16					4.3			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-106	11/2/18 12:00	N	5.4	1.8 J	4.8	0.5 U	16					4.1			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-107	6/5/18 12:45	N	7		6.5		9.9								0.93 U	0.93 U						
SW-DB-107	10/2/18 16:30	N	5	2	5.1	0.39 U	12					2.5			0.96 U	0.96 U	1.2 U				0.48 U	0.48 U
SW-DB-107	11/2/18 13:20	N	4.6	1.8	3.9	0.34 U	11					2.2			0.85 U	0.85 U	1 U				0.43 U	0.43 UJ
SW-DB-108	6/5/18 12:15	N	6.1		6.1		6.9								0.91 U	0.91 U						
SW-DB-108	10/2/18 16:50	N	4.8	1.5 J	4.4	0.4 U	5.2					1 U			1 U	1 U	1.2 U				0.5 U	0.5 U
SW-DB-108	11/2/18 13:40	N	3.9	1 J	2.9	0.5 U	4.5					1.2 U			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-109	6/5/18 13:10	N	5.7		5.4		5.1								0.91 U	0.91 U						
SW-DB-109	10/2/18 17:10	N	4.3	1.1 J	4.1	0.5 U	4.7					1.2 U			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-DB-109	11/2/18 13:03	N	2.7 UB	0.75 J	1.9	0.35 U	4.7					0.87 U			0.87 U	0.87 U	1 U				0.43 U	0.43 UJ
SW-MERR-101W-IC	11/16/17 17:30	N	0.7 J		0.7 U		1 U								0.7 U	0.7 U						
SW-MERR-101W-NS	11/16/17 17:20	N	0.8 J		1 U		2 U								1 U	1 U						
SW-MERR-101W-NS	6/4/18 7:10	N	1.4 J	0.39 UJ	1 J	0.39 U	1.7 J	0.59 U	0.59 U	0.29 U	0.98 UJ	0.98 UJ	2 U	2.9 U	0.98 U	0.98 U	0.98 UJ	0.98 UJ	2.9 R	2.9 UJ	0.98 UJ	0.54 UB
SW-MERR-101W-NS	6/4/18 7:10	N	1.5 J	0.39 UJ	1 J	0.39 U	1.8 J	0.59 U	0.59 U	0.29 U	0.98 UJ	0.98 UJ	2 U	2.9 U	0.98 U	0.98 U	0.98 UJ	0.98 UJ	2.9 R	2.9 R	0.98 UJ	0.78 UB
SW-MERR-101W-NS	9/10/18 18:05	N	1.7	0.34 U	1.2 J	0.34 U	2.2					1.6 J			1 J	0.85 U	1 U				0.68 J	0.43 U
SW-MERR-101W-NS	11/13/18 8:45	N	0.46 J	0.34 UJ	0.38 J	0.34 U	1.2 J					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.43 U
SW-MERR-201W-IC	11/16/17 16:05	N	0.7 J		0.7 U		1 U								0.7 U	0.7 U						
SW-MERR-201W-IC	6/4/18 6:15	N	1.8 J	0.59 J	2.4	0.55 J	35	0.57 U	0.57 U	0.29 U	0.95 UJ	120	1.9 U	2.9 U	4.6	0.95 U	0.95 UJ	0.95 UJ	2.9 R	2.9 R	3 J	2.1 UB
SW-MERR-201W-IC	9/10/18 17:30	N	1.5	0.35 U	1.1 J	0.35 U	2					0.87 U			0.87 U	0.87 U	1 U				0.43 U	0.44 U
SW-MERR-201W-IC	11/13/18 8:50	N	0.45 J	0.34 UJ	0.38 J	0.34 U	0.84 J					0.85 U			0.85 U	0.85 U	1 U				0.43 U	0.43 U
SW-MERR-201W-NS	11/16/17 15:55	N	0.8 J		1 U		3 J								1 U	1 U						
SW-MERR-201W-NS	6/4/18 6:10	N	1.5 J	0.53 J	1.7 J	0.4 U	10	0.59 U	0.59 U	0.3 U	0.99 UJ	8.5 J	2 U	3 U	1.5 J	0.99 U	0.99 UJ	0.99 UJ	3 UJ	3 UJ	1.9 J	
SW-MERR-201W-NS	9/10/18 17:15	N	2.2	0.95 J	3.1	0.38 J	35					15			15	0.85 U	1 U				3.8	0.43 U
SW-MERR-201W-NS	11/13/18 8:35	N	0.46 J	0.34 UJ	0.37 J	0.34 U	6.2					2.8 J			1.2 J	0.86 U	1 U				0.43 U	0.43 U
SW-MERR-201W-NS	11/13/18 8:35	FD	0.51 J	0.34 UJ	0.57 J	0.34 U	7.8					7.9 J			2.1 J	0.85 U	1 U				0.61 J	0.43 UJ

Table 6: PFAS Surfacewater Wet-Weather Analytical Results Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

Location	Sample Date	Sample Type	First Flush? (Y/N)	CAS No. - Analysis Name / Validated (Y/N)	375-22-4 - Perfluorobutanoic acid (PFBA)	2706-90-3 - Perfluoropentanoic acid (PFPeA)	307-24-4 - Perfluorohexanoic acid (PFHxA)	375-85-9 - Perfluoroheptanoic acid (PFHpA)	335-67-1 - Perfluorooctanoic acid (PFOA)	375-95-1 - Perfluorononanoic acid (PFNA)	335-76-2 - Perfluorodecanoic acid (PFDA)	2058-94-8 - Perfluoroundecanoic Acid (PFUnA)	307-55-1 - Perfluorododecanoic acid (PFDoA)	72629-94-8 - Perfluorotridecanoic Acid (PFTriA)	376-06-7 - Perfluorotetradecanoic acid (PFTA)	67905-19-5 - Perfluorohexadecanoic acid	16517-11-6 - Perfluorooctadecanoic acid
					ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
SW-MERR-202W-IC	11/16/17 14:10	N	NA	Y	3 U	1 J	2	2 J	3	0.5 U	0.7 U	0.7 U	0.5 U	0.5 U	0.5 U		
	6/4/18 7:20	N	NA	Y	1.8 U	2.5 J	2.7	1.5 J	4	0.36 U	0.9 U	0.36 U	0.27 U	0.27 U	0.27 U		
	9/10/18 18:50	N	NA	Y	1.9 J	2.8 J	3.2	1.6 UB	4.5 UB	0.49 J	0.78 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
	11/13/18 7:45	N	NA	Y	1.7 U	1.7 U	0.82 J	0.65 J	2.4	0.34 U	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-MERR-202W-NS	11/16/17 14:05	N	NA	Y	3 U	2 J	2	1 J	4	0.5 U	0.7 U	0.7 U	0.5 U	0.5 U	0.5 U		
	6/4/18 7:15	N	NA	Y	1.8 U	2.4 J	3	1.4 J	4.2	0.36 U	0.91 U	0.36 U	0.27 U	0.27 U	0.27 U		
	9/10/18 18:40	N	NA	Y	1.9 J	2.6 J	2.9	1.4 UB	4.5 UB	0.44 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
	11/13/18 8:00	N	NA	Y	1.7 U	1.7 U	0.96 J	0.65 J	2.5	0.34 U	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-MERR-301W-NS	6/5/18 8:45	N	NA	Y	1.8 U	2.4 J	2.3	1.1	3.5	0.36 U	0.9 U	0.36 U	0.27 U	0.27 U	0.27 U		
	10/2/18 10:40	N	NA	Y	1.8 U	1.8 U	1.6 J	1	8.4 UB	0.36 J	0.8 U	0.36 U	0.45 U	0.36 U	0.27 U	0.27 U	
	11/2/18 9:25	N	NA	Y	2.5 U	2.5 U	1.3 J	0.8 J	2.8	0.5 U	1.1 U	0.5 U	0.62 U	0.5 U	0.37 U	0.37 U	
SW-MERR-302W-IC	6/5/18 9:50	N	NA	Y	1.9 U	3.1 J	3.1	1.6	5.8	0.38 U	0.94 U	0.38 U	0.28 U	0.28 U	0.28 U		
	10/2/18 9:50	N	NA	Y	1.9 U	1.9 U	2.4	1.5	5.8	0.43 J	0.87 U	0.39 U	0.48 U	0.39 U	0.29 U	0.29 U	
SW-MERR-302W-NS	6/5/18 9:30	FD	NA	Y	1.8 U	2.8 J	2.7	1.4 J	6.6 J	0.36 U	0.91 U	0.36 U	0.27 U	0.27 U	4.2 J		
	6/5/18 9:30	N	NA	Y	1.8 U	4.4 J	5.4	2.8 J	14 J	0.45 J	0.92 U	0.37 U	0.28 U	0.28 U	0.28 UJ		
	10/2/18 9:55	N	NA	Y	2.1 U	2.1 U	2.4	1.5	5.2	0.41 U	0.93 U	0.41 U	0.52 U	0.41 U	0.31 U	0.31 U	
SW-MERR-303W-NS	6/5/18 10:10	N	NA	Y	1.8 U	2.6 J	2.9	1.4	5.1	0.37 U	0.92 U	0.37 U	0.27 U	0.27 U	0.27 U		
	10/2/18 9:20	N	NA	Y	1.7 U	1.8 J	2.4	1.5	5.2 UB	0.35 U	0.78 U	0.35 U	0.43 U	0.35 U	0.26 U	0.26 U	
SW-MERR-401W-NS	6/5/18 9:10	N	NA	Y	1.8 U	2.8 J	2.9	1.4	6.1	0.37 U	0.92 U	0.37 U	0.28 U	0.28 U	0.28 U		
	10/2/18 10:10	N	NA	Y	1.7 U	2.2 J	2.4	1.6	5.8 UB	0.36 J	0.76 U	0.34 U	0.42 U	0.34 U	0.25 U	0.25 U	
SW-MERR-402W-IC	6/5/18 10:25	N	NA	Y	1.8 U	3.4 J	3.8	2.2	9	0.36 U	0.9 U	0.36 U	0.27 U	0.27 U	0.27 U		
	10/2/18 10:38	N	NA	Y	1.7 U	2.1 J	2.7	1.6	6.6 UB	0.38 J	0.78 U	0.35 U	0.44 U	0.35 U	0.26 U	0.26 U	
SW-MERR-402W-NS	6/5/18 10:20	N	NA	Y	1.9 J	5.3 J	6.9	4.5	27	0.4 J	0.91 U	0.36 U	0.27 U	0.27 U	0.27 U		
	10/2/18 10:46	N	NA	Y	1.7 U	2.1 J	3	1.9	8.7	0.36 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
	11/2/18 9:50	N	NA	Y	3.1 J	7.3	10	6.1	35	0.55 J	0.78 U	0.35 U	0.43 U	0.35 U	0.26 U	0.26 U	
SW-MERR-403W-NS	6/5/18 10:45	N	NA	Y	1.8 U	3.4 J	3.7	1.9	8.8	0.37 U	0.92 U	0.37 U	0.27 U	0.27 U	0.27 U		
	10/2/18 10:28	N	NA	Y	1.7 U	2 J	2.3	1.5	5.8	0.42 J	0.76 U	0.34 U	0.42 U	0.34 U	0.25 U	0.25 U	
	11/2/18 10:20	N	NA	Y	2.2 J	5 J	6.4	4.1	22	0.47 J	0.77 U	0.34 U	0.43 U	0.34 U	0.26 U	0.26 U	
SW-UBA-101	6/4/18 7:55	N	NA	Y	32	100	160	120 J	1100	4.7	2.2	0.36 U	0.27 U	0.27 U	0.27 U		
	6/4/18 7:55	N	NA	Y	33	100	160	120 J	1200	5.4	2.5	0.36 U	0.27 U	0.27 U	0.27 U		
	10/2/18 15:20	FD	NA	Y	40	100	170	120	1300 J	6.5	2.9	0.47 J	0.47 U	0.38 U	0.28 U	0.28 U	
	10/2/18 15:20	N	NA	Y	42	99	170	120	790 J	9	3.8	0.57 J	0.49 U	0.39 U	0.29 U	0.29 U	
SW-UBA-102	6/4/18 8:55	N	NA	Y	20 U	64	78	47 J	310	4 U	10 U	4 U	3 U	3 U	3 U		
	10/2/18 14:55	N	NA	Y	39	110	170	120	1000	6.5	2.7	0.48 J	0.48 U	0.38 U	0.29 U	0.29 U	

Location	Sample Date	375-73-5 - Perfluorobutanesulfonic acid (PFBS)	2706-91-4 - Perfluoropentanesulfonic acid (PFPeS)	355-46-4 - Perfluorohexanesulfonic acid (PFHxS)	375-92-8 - Perfluoroheptanesulfonic acid (PFHPS)	1763-23-1 - Perfluorooctanesulfonic acid (PFOS)	68259-12-1 - Perfluorononanesulfonic acid (PFNS)	335-77-3 - Perfluorodecanesulfonic acid (PFDS)	79780-39-5 - Perfluorododecanesulfonic acid (PFDoDS)	757124-72-4 - 4:2 Fluorotelomer sulfonic acid	27619-97-2 - 6:2 Fluorotelomer sulfonic acid	39108-34-4 - 8:2 Fluorotelomer sulfonic acid	120226-60-0 - 10:2 Fluorotelomer sulfonic acid	2991-50-6 - NEtFOSAA	2355-31-9 - NMeFOSAA	1691-99-2 - 2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	24448-09-7 - 2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	4151-50-2 - N-ethyl perfluoro-1-octanesulfonamide	31506-32-8 - N-methyl perfluoro-1-octanesulfonamide	754-91-6 - PFOSA	13252-13-6 - 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid
		ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l	ng/l
SW-MERR-202W-IC	11/16/17 14:10	0.7 J		0.7 U		1 U								0.7 U	0.7 U						
	6/4/18 7:20	1.2		0.86 J		1.6 J								0.9 U	0.9 U						
	9/10/18 18:50	1.7	0.34 U	1.1 J	0.34 U	2					0.94 J			0.86 U	0.86 U	1 U				0.43 U	0.43 U
	11/13/18 7:45	0.47 J	0.34 UJ	0.35 J	0.34 U	0.84 J					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.43 U
SW-MERR-202W-NS	11/16/17 14:05	0.8 J		0.7 J		1 U								0.7 U	0.7 U						
	6/4/18 7:15	1.2		0.91 J		1.7 J								0.91 U	0.91 U						
	9/10/18 18:40	1.5	0.34 U	1 J	0.34 U	1.8 UB					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.42 U
	11/13/18 8:00	0.44 J	0.34 UJ	0.35 J	0.34 U	0.86 J					0.85 U			0.85 U	0.85 U	1 U				0.43 U	0.43 UJ
SW-MERR-301W-NS	6/5/18 8:45	1.3		0.96 J		1.6 J								0.9 U	0.9 U						
	10/2/18 10:40	0.66 J	0.36 U	0.64 J	0.36 U	1.4 J					0.89 U			0.89 U	0.89 U	1.1 U				0.45 U	0.45 U
	11/2/18 9:25	0.52 UB	0.5 U	0.5 U	0.5 U	2.4 J					1.2 U			1.2 U	1.2 U	1.5 U				0.62 U	0.62 U
SW-MERR-302W-IC	6/5/18 9:50	1.3		1.1 J		2								0.94 U	0.94 U						
	10/2/18 9:50	0.75 J	0.39 U	0.6 J	0.39 U	1.6 J					0.97 U			0.97 U	0.97 U	1.2 U				0.48 U	0.48 U
SW-MERR-302W-NS	6/5/18 9:30	1.2		0.94 J		2.6								0.91 U	0.91 U						
	6/5/18 9:30	1.3		0.93 J		2								0.92 U	0.92 U						
	10/2/18 9:55	0.77 J	0.41 U	0.57 J	0.41 U	1.5 J					1 U			1 U	1 U	1.2 U				0.52 U	0.52 U
SW-MERR-303W-NS	6/5/18 10:10	1.3 J		0.86 J		1.9								0.92 U	0.92 U						
	10/2/18 9:20	0.64 J	0.35 U	0.61 J	0.35 U	1.4 J					0.87 U			0.87 U	0.87 U	1 UJ				0.43 U	0.43 U
SW-MERR-401W-NS	6/5/18 9:10	1.1		0.88 J		1.6 J								0.92 U	0.92 U						
	10/2/18 10:10	0.82 J	0.34 U	0.7 J	0.34 U	1.7					0.85 U			0.85 U	0.85 U	1 UJ				0.42 UJ	1.1 UB
SW-MERR-402W-IC	6/5/18 10:25	1.2		0.99 J		1.8 J								0.9 U	0.9 U						
	10/2/18 10:38	0.7 J	0.35 U	0.58 J	0.35 U	1.3 J					0.87 U			0.87 U	0.87 U	1 U				0.44 U	0.44 U
SW-MERR-402W-NS	6/5/18 10:20	1.5		1 J		2.2								0.91 U	0.91 U						
	10/2/18 10:46	0.72 J	0.34 U	0.56 J	0.34 U	1.5 J					0.85 U			0.85 U	0.85 U	1 U				0.79 J	0.43 U
	11/2/18 9:50	0.88 UB	0.35 U	0.91 J	0.35 U	2.9					0.86 U			0.86 U	0.86 U	1 U				0.43 U	0.43 UJ
SW-MERR-403W-NS	6/5/18 10:45	1.3		1 J		1.9								0.92 U	0.92 U						
	10/2/18 10:28	0.85	0.34 U	0.61 J	0.34 U	1.5 J					0.85 U			0.85 U	0.85 U	1 U				0.6 J	0.42 U
	11/2/18 10:20	0.73 UB	0.34 U	0.76 J	0.34 U	2.1					0.85 U			0.85 U	0.85 U	1 UJ				0.43 U	0.43 UJ
SW-UBA-101	6/4/18 7:55	4.6 J		6.9		19 J								0.9 U	0.9 U						
	6/4/18 7:55	4.7 J		7.2		20 J								0.91 U	0.91 U						
	10/2/18 15:20	6.3 J	2.1	7.8	0.67 J	24					0.95 U			0.95 U	0.95 U	1.1 U				0.47 U	0.47 U
	10/2/18 15:20	10 J	2	6.7	0.69 J	29					0.98 U			0.98 U	0.98 U	1.2 U				0.49 U	0.91 J
SW-UBA-102	6/4/18 8:55	3 J		4 J		16 J								10 U	10 U						
	10/2/18 14:55	6.2	2	7.5	0.38 U	21					0.96 U			0.96 U	0.96 U	1.2 U				0.48 U	0.48 U

Notes:

Abbreviations

B = Concentration was identified in the blank sample and normal sample
FD = Field duplicate sample
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
N = Normal (primary) sample
ng/l = nanograms per liter
R = Rejected
U = The analyte was analyzed for, but was not detected above the level of the reported sample method detection limit (MDL).

Prepared by: ESI
Checked by: MLS
Reviewed by: RWB

Table 7: Sediment Analytical Results
Saint-Gobain Performance Plastics
Merrimack, New Hampshire

			Sample ID	SED-MERR-301W			SED-MERR-302W			SED-MERR-303W			SED-MERR-US-2018A		
			Lab Sample ID	9/6/2018			9/6/2018			9/6/2018			9/6/2018		
			Sample Collection Date	9792945			9792946			9792947			9792948		
			N= Normal; FD= Field Duplicate	N			N			N			N		
Analysis Name	**CAS Number**	**Unit**	**Validated?**	**Result**	**Qual**	**MDL**	**Result**	**Qual**	**MDL**	**Result**	**Qual**	**MDL**	**Result**	**Qual**	**MDL**
PFAS Analyte List															
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluoroheptanesulfonic acid (PFHPS)	375-92-8	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluoro-octanesulfonic acid (PFOS)	1763-23-1	ng/g	Yes	0.33	U	0.33	0.43	U	0.43	0.37	U	0.37	0.37	U	0.37
Perfluorobutanoic acid (PFBA)	375-22-4	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluoropentanoic Acid (PFPeA)	2706-90-3	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorooctanoic acid (PFOA)	335-67-1	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorononanoic acid (PFNA)	375-95-1	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorodecanoic acid (PFDA)	335-76-2	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.28	J	0.24	0.24	U	0.24
Perfluorotetradecanoic acid (PFTA)	376-06-7	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.62	J	0.24	0.24	U	0.24
Perfluorohexadecanoic acid	67905-19-5	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.4	J	0.24	0.24	U	0.24
NMeFOSAA	2355-31-9	ng/g	Yes	0.55	U	0.55	0.71	U	0.71	0.61	U	0.61	0.61	U	0.61
NEtFOSAA	2991-50-6	ng/g	Yes	0.55	U	0.55	0.71	U	0.71	0.61	U	0.61	0.61	U	0.61
6:2 Fluorotelomer sulfonic acid	27619-97-2	ng/g	Yes	0.66	U	0.66	0.85	U	0.85	0.73	U	0.73	0.73	U	0.73
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	1691-99-2	ng/g	Yes	0.55	U	0.55	0.71	U	0.71	0.61	U	0.61	0.61	U	0.61
PFOSA	754-91-6	ng/g	Yes	0.22	U	0.22	0.28	U	0.28	0.24	U	0.24	0.24	U	0.24
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	13252-13-6	ng/g	Yes	0.45	U	0.45	0.53	U	0.53	0.5	U	0.5	0.47	U	0.47
Wet Chemistry/Grain Size															
Total Organic Carbon	None	mg/kg	Yes	2120		115	8640		386	2220		136	1220		133
% Gravel	None	%	No	24			0			0			0.8		
% Sand	None	%	No	72.1			90			88.1			93.7		
% Silt& Clay	None	%	No	3.9			10			11.9			5.5		

Prepared By: ESI
Checked By: MLS
Reviewed By: RWB

Notes:

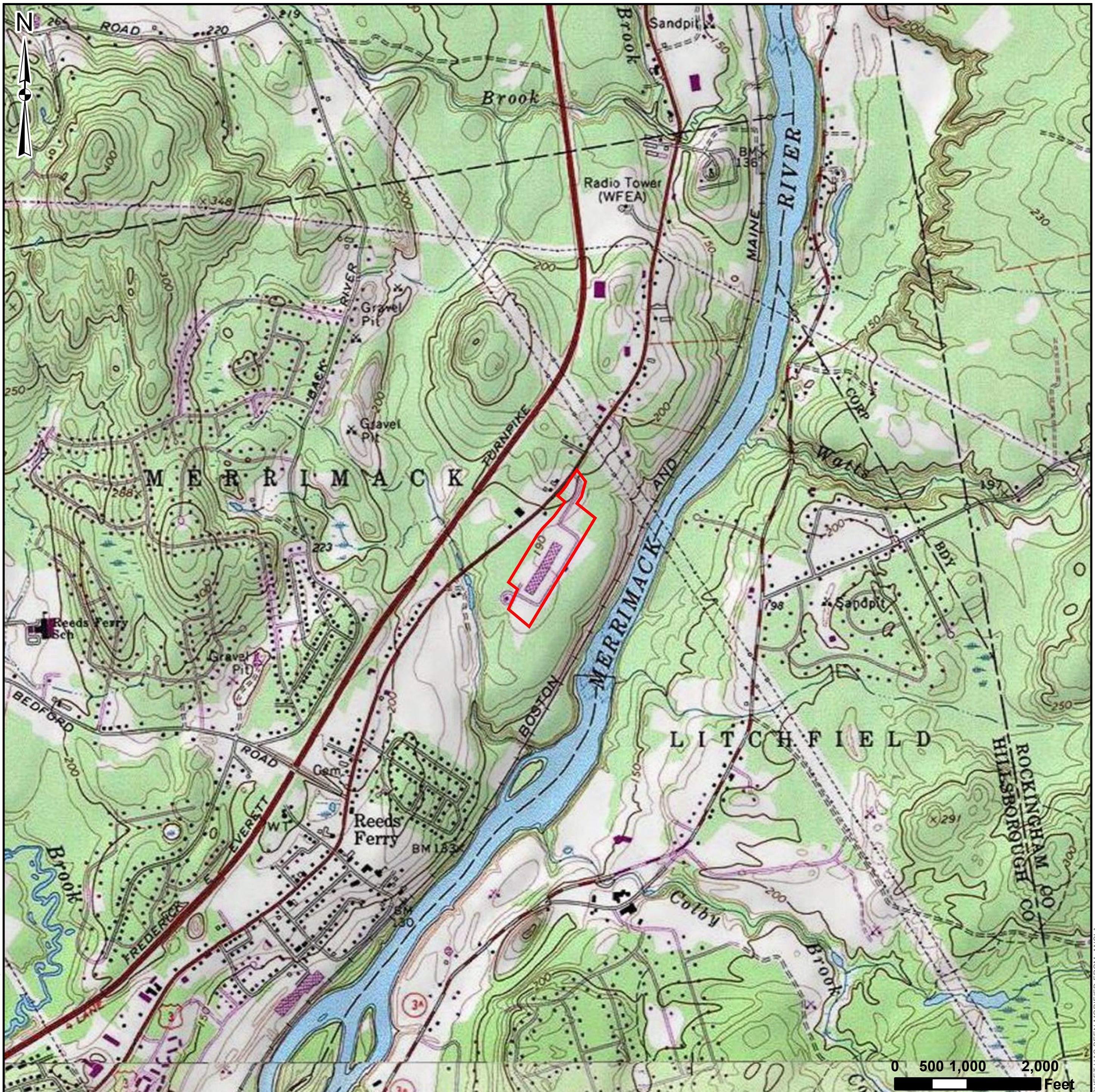
1. Data was validated by Environmental Standards, Inc. (ESI) of Valley Forge, Pennsylvania. For details on validation or analytical methods, see the "Data Usability Summary Report, Analysis of Various Analytes in Aqueous and Sediment Samples, Town of Merrimack, New Hampshire, Sample Delivery Group: GOA28" prepared by ESI dated November 28, 2018.

2. Golder collected the sediment samples on the dates indicated. Samples were submitted to Geotesting Express for grain size analysis (% gravel, % sand, and % silt & clay). Data presented in the table are unvalidated.

Abbreviations:
MDL = method detection limit
mg/kg = miligrams per kilogram
N/A = Not applicable
N = Normal (primary) sample
ng/g = nanograms per gram
Qual = Qualifier

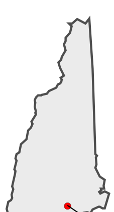
Qualifications:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for, but was not detected above the level of the reported sample method detection limit (MDL).

FIGURES



LEGEND

Approximate SGPP Facility Property Boundary



REFERENCE

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CLIENT

SAINT-GOBAIN PERFORMANCE PLASTICS

PROJECT

SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY
MERRIMACK, NH

TITLE

FACILITY LOCATION MAP

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-29
PREPARED	SHL
DESIGN	HDE
REVIEW	RWB
APPROVED	APTM

PROJECT No.	CONTROL	Rev.	FIGURE
166-8623	-	0	1

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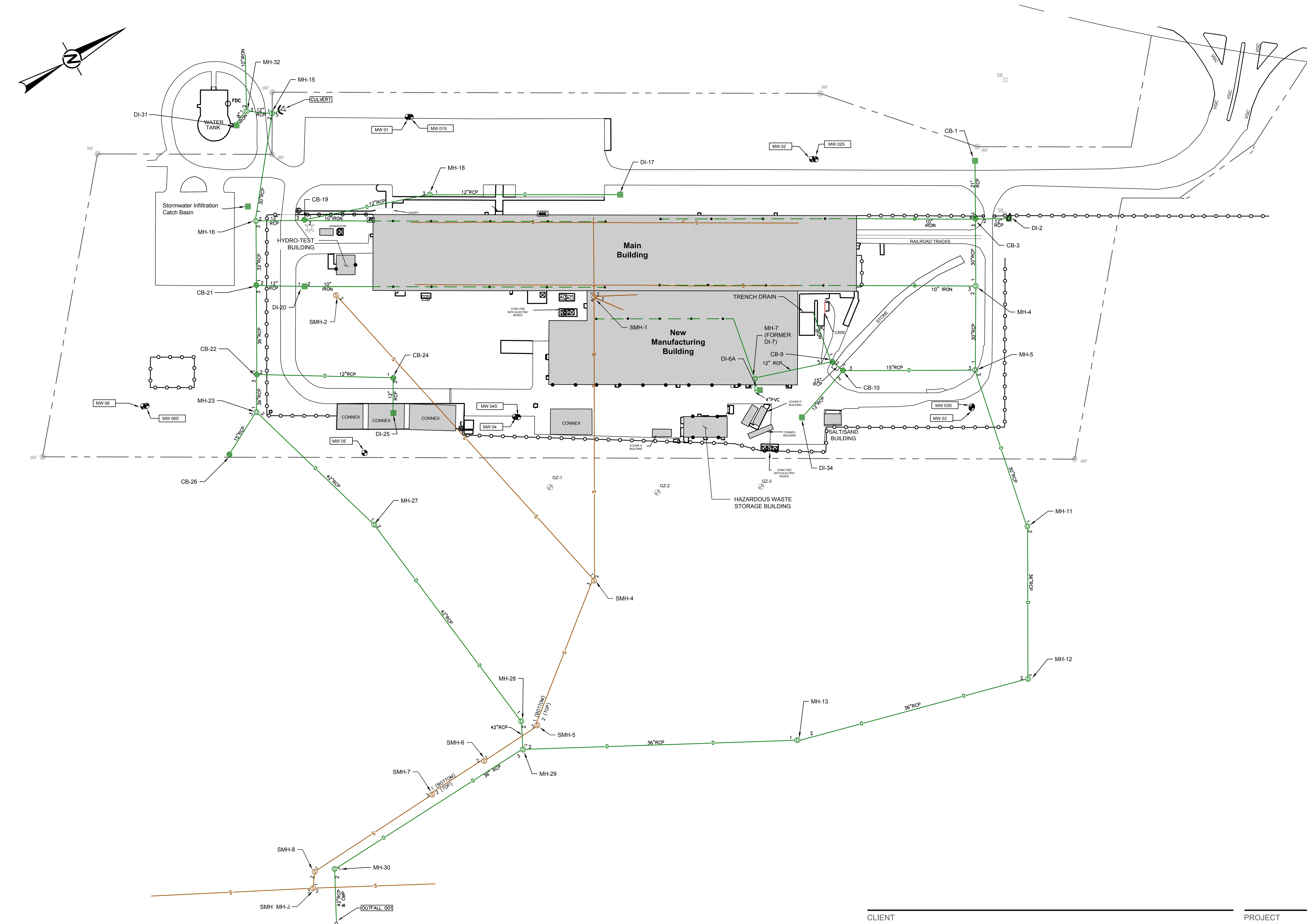
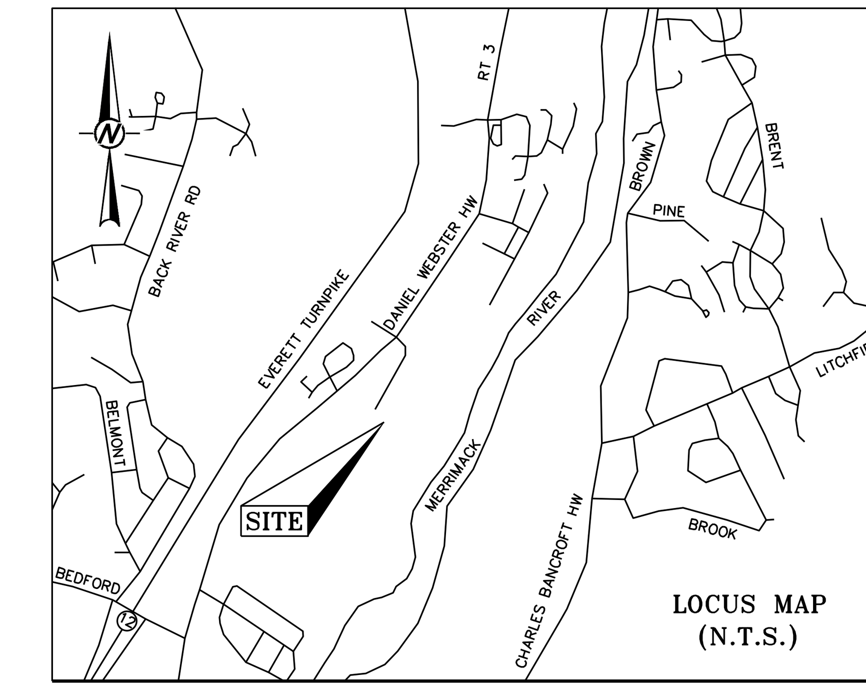
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A





LOCUS MAP
(N.T.S.)

LEGEND

IRF IRON ROD FOUND	CATCH BASIN
CULVERT	ROUND CATCH BASIN
POST	UNKNOWN MANHOLE
TBM TEMPORARY BENCHMARK	DRAIN MANHOLE
SB STONE BOUND FOUND	EXTERIOR ROOF DRAIN DOWNSPOUT
MONITORING WELL	SEWER MANHOLE
OFF-PROPERTY MONITORING WELL	BOLLARD
	FIRE HYDRANT

CHAIN LINK FENCE
PROPERTY LINE
STORMWATER CONVEYANCE SYSTEM
ROOF DRAIN LINE (ABOVE GROUND)
SANITARY SEWER LINE

NOTES

1. THIS PLAN WAS PREPARED FROM FIELD SURVEY CONDUCTED BY WSP IN APRIL OF 2016, AUGUST OF 2017 AND OCTOBER OF 2017.

2. THE HORIZONTAL DATUM SHOWN HEREON REFERENCES THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD83.

3. THE VERTICAL DATUM SHOWN HEREON REFERENCES NAVD88.

4. THIS PLAN ONLY REFERENCES THE BENCHMARK SET BY WSP AND IS LABELED AS 'TBM A'. ANY OTHER BENCHMARKS FOUND ON SITE WERE NOT SET OR VERIFIED BY WSP.

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PLAN REFERENCES

1. PLAN ENTITLED "SUBDIVISION PLAN (MAP 6E, LOT 3-4), MERRIMACK COMMERCE PARK, DANIEL WEBSTER HIGHWAY, MERRIMACK, NEW HAMPSHIRE, PREPARED FOR JOHN J. FLATELY COMPANY." DATED NOVEMBER 3, 2012. PREPARED BY HAYNER/ SWANSON, INC. PLAN ON RECORD AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN No. 37652.

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3. PLAN ENTITLED "PLAN OF LOTS PREPARED FOR CHEMICAL FABRICS CORPORATION, DANIEL WEBSTER HIGHWAY, MERRIMACK, N.H." DATED MARCH 9, 1987. PREPARED BY T.F. MORAN, INC. PLAN ON RECORD AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN No. 20689.

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5. PLAN ENTITLED "LOT LINE REVISION PLAN, LAND OF CHEMICAL FABRICS CORPORATION, DANIEL WEBSTER HIGHWAY, MERRIMACK, N.H." DATED AUGUST 7, 1986. PREPARED BY GEORGE F. KELLER, INC. PLAN ON RECORD AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN No. 19804.

6. STACK LOCATIONS ARE BASED ON A LASER SCAN OF THE ROOFTOP AND STACKS COMPLETED BY C.T. MALE IN MARCH 2017.

0 80 160
1" = 80' FEET

CLIENT
SAINT-GOBAIN PERFORMANCE PLASTICS

PROJECT
SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY
MERRIMACK, NEW HAMPSHIRE

CONSULTANT

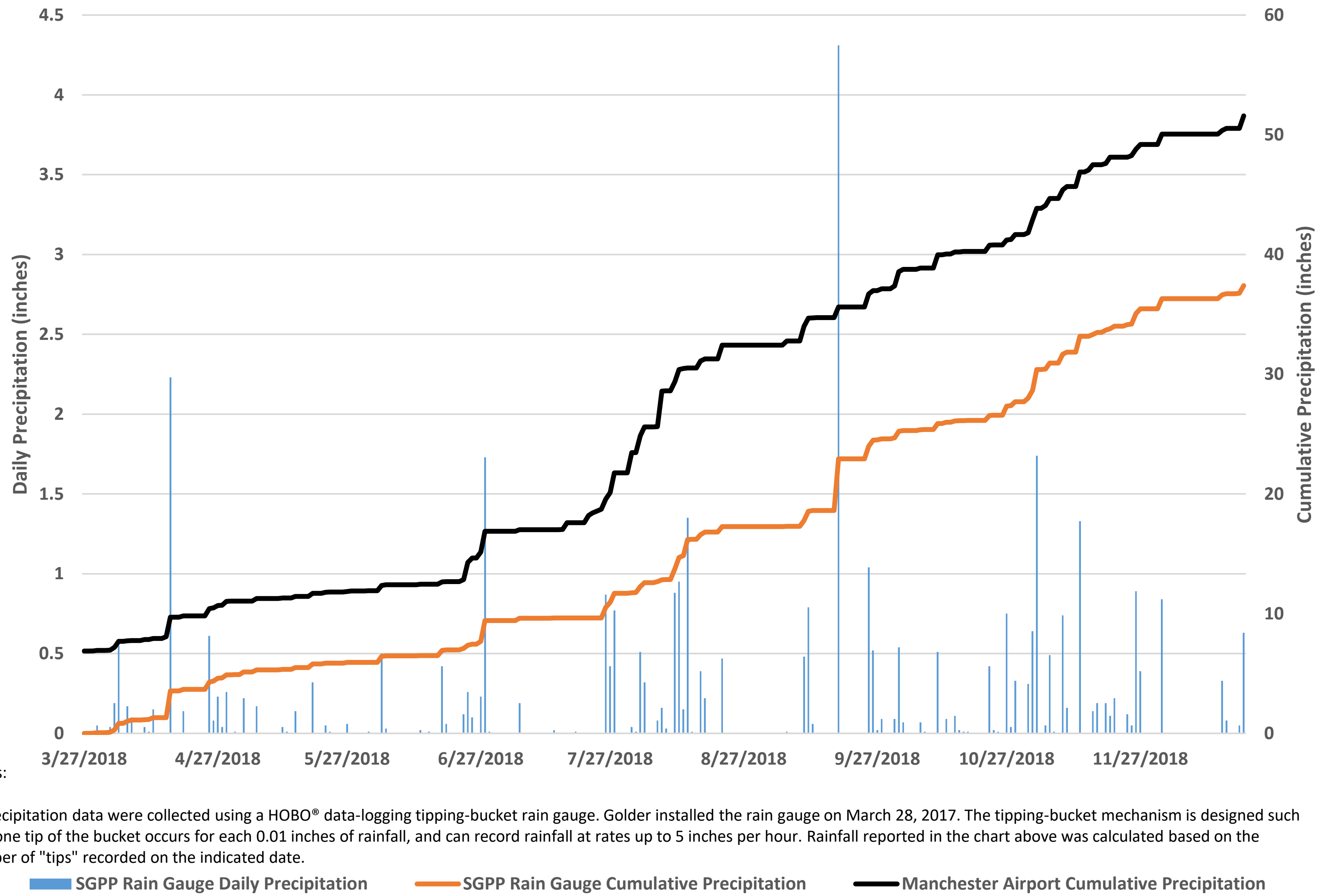
GOLDER

YYYY-MM-DD	2019-02-25
DESIGNED	SD
PREPARED	RWC
REVIEWED	RWB
APPROVED	APTM

TITLE
SITE PLAN

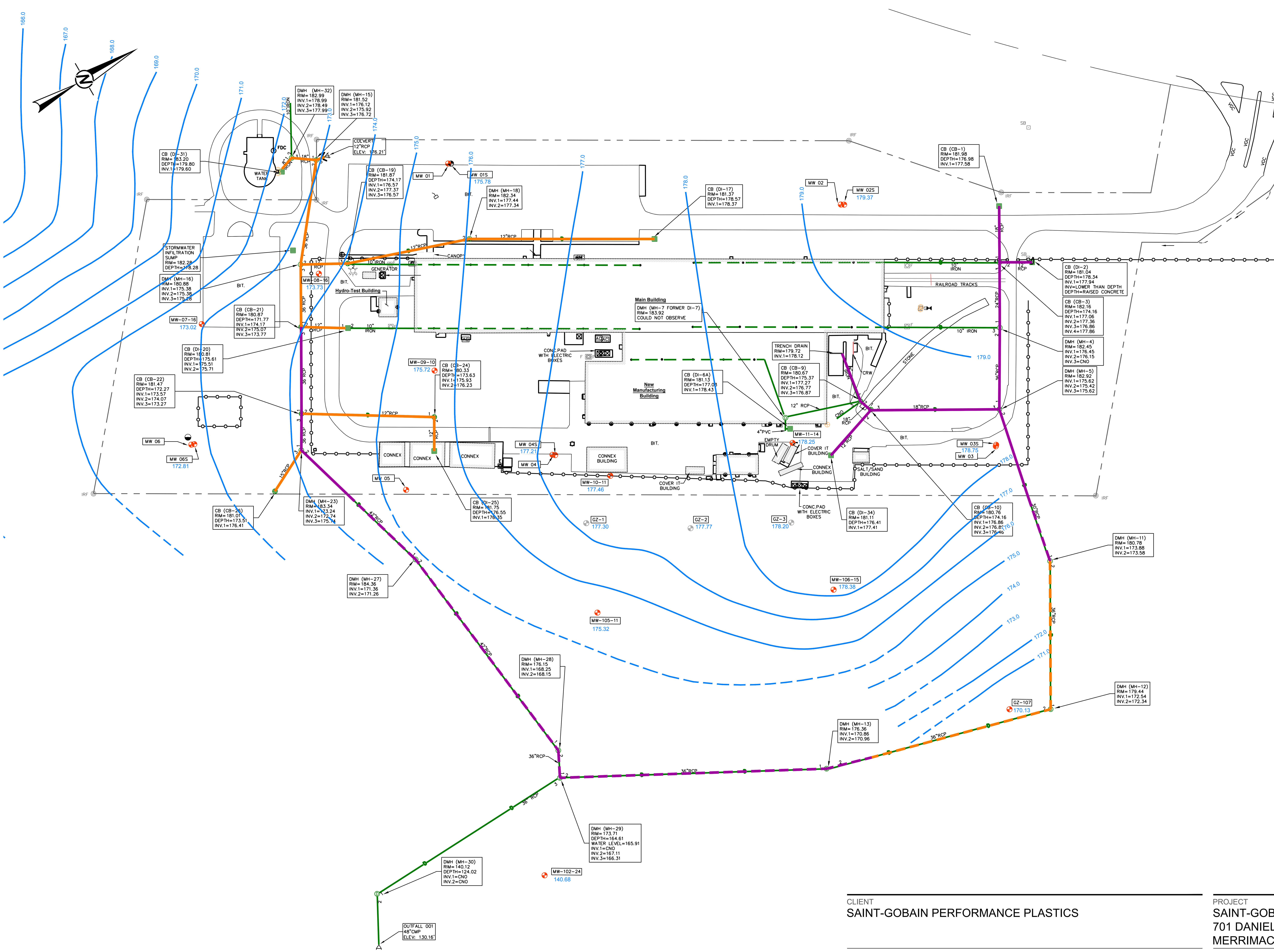
PROJECT NO.	CONTROL	REV.	FIGURE
1668623	03	0	2

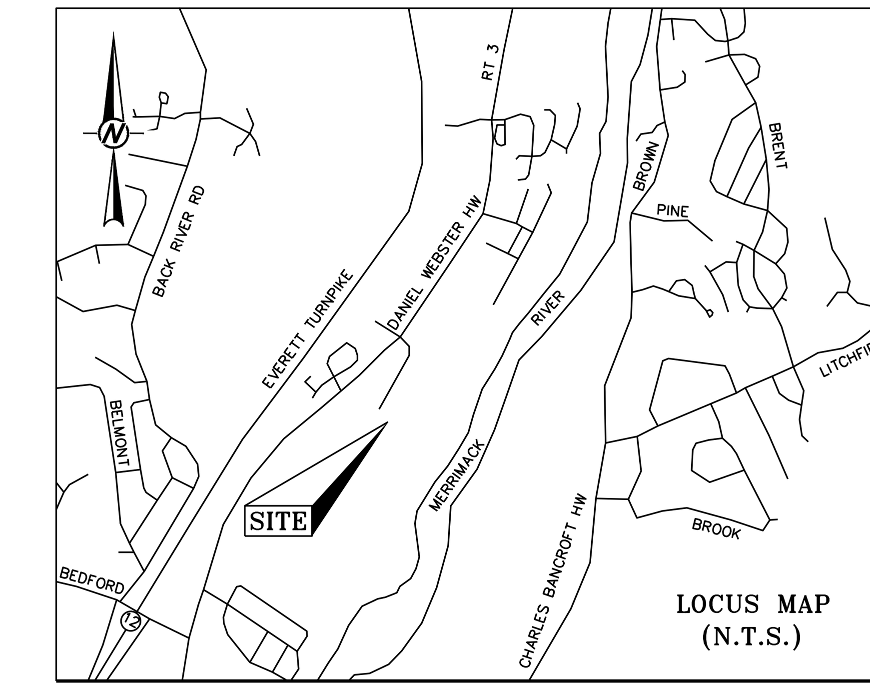
Figure 3: Site Precipitation Data Summary
Saint-Gobain Performance Plastics
Merrimack, New Hampshire



Notes:

1. Precipitation data were collected using a HOBO® data-logging tipping-bucket rain gauge. Golder installed the rain gauge on March 28, 2017. The tipping-bucket mechanism is designed such that one tip of the bucket occurs for each 0.01 inches of rainfall, and can record rainfall at rates up to 5 inches per hour. Rainfall reported in the chart above was calculated based on the number of "tips" recorded on the indicated date.





LEGEND

IRF	IRON ROD FOUND	SB	STONE BOUND FOUND
F	FIRE VALVE		ELECTRIC BOX
	CULVERT	AC	AC UNIT
G	GAS HANDHOLE		CATCH BASIN
	GAS GATE		ROUND CATCH BASIN
	BORING	FDC	FIRE DEPARTMENT CONNECTION
	POST		UNKNOWN MANHOLE
TBM	TEMPORARY BENCHMARK		DRAIN MANHOLE
VGC	VERTICAL GRANITE CURB		EXTERIOR ROOF DRAIN DOWNSPOUT
CNO	COULD NOT OBSERVE		SEWER MANHOLE
NPV	NO PIPES VISIBLE		BOLLARD
CMP	CORRUGATED METAL PIPE		FIRE HYDRANT
RCP	REINFORCED CONCRETE PIPE		MONITORING WELL
			UNKNOWN MONITORING WELL

CHAIN LINK FENCE
PROPERTY LINE
RIGHT OF WAY
GROUNDWATER ELEVATION CONTOUR (SEE NOTE 6)
INFERRED GROUNDWATER ELEVATION CONTOUR (SEE NOTE 6)

STORMWATER CONVEYANCE SYSTEM

INVERT ELEVATIONS UNKNOWN
ABOVE WATER TABLE SURFACE
INFERRED ABOVE WATER TABLE SURFACE
BELOW WATER TABLE SURFACE
INFERRED BELOW WATER TABLE SURFACE

NOTES

1. THIS PLAN WAS PREPARED FROM FIELD SURVEY CONDUCTED BY WSP IN APRIL OF 2016, AUGUST OF 2017 AND OCTOBER OF 2017.

2. THE HORIZONTAL DATUM SHOWN HEREON REFERENCES THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD83.

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6. GROUNDWATER ELEVATIONS MEASURED IN DECEMBER 2018. GROUNDWATER ELEVATION CONTOURS DEPICT THE INTERPRETED APPROXIMATE ELEVATION OF THE PHREATIC (GROUNDWATER TABLE) SURFACE BASED ON THE GROUNDWATER ELEVATION DATA PROVIDED. THE ACTUAL ELEVATION OF THE PHREATIC SURFACE IS LIKELY MORE HETEROGENEOUS THAN SHOWN. ACTUAL CONDITIONS WILL VARY. THE DEPTH TO GROUNDWATER IS KNOWN TO VARY WITH TIME.

0 80 160
1" = 80' FEET

CLIENT
SAINT-GOBAIN PERFORMANCE PLASTICS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-25
DESIGNED	SD
PREPARED	RWC
REVIEWED	RWB
APPROVED	APTM

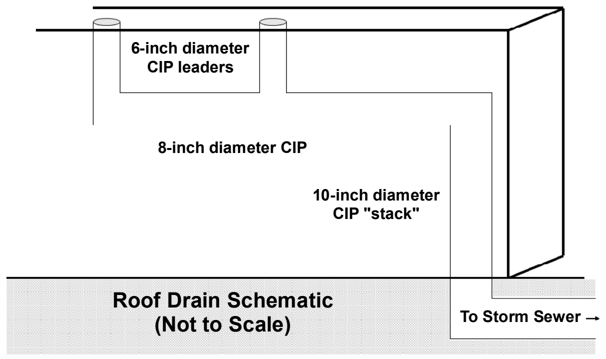
PROJECT
SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY
MERRIMACK, NEW HAMPSHIRE

TITLE
DECEMBER 2018 SHALLOW GROUNDWATER ELEVATION CONTOURS AND STORMWATER CONVEYANCE SYSTEM

PROJECT NO.	CONTROL	REV.	FIGURE
1668623	03	0	04

LEGEND

- RD-6 — Roof Drain Inlet
- MH-7 — Stormwater catch basin
- Approximate Roof Drain Line (See Note 2)
- Surface Water Flow Direction
- Approximate Underground Roof Drain Line (See Note 2)



0 60 120 240
Feet

NOTES

1. ROOF DRAIN LINE LOCATIONS HAVE NOT BEEN SURVEYED IN THE FIELD AND ARE APPROXIMATE.

REFERENCE

IMAGERY: GOOGLE, LANDSAT/COPERNICUS. IMAGERY DATE: 2017-09-12.

CLIENT
SAINT-GOBAIN PERFORMANCE PLASTICS

PROJECT
SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY, MERRIMACK, NH

TITLE
ROOF DRAIN FLOW DIRECTION AND SCHEMATIC

CONSULTANT
GOLDER

YYYY-MM-DD	3/14/2019
PREPARED	SHL
DESIGN	HDE
REVIEW	RWB
APPROVED	APTM

PROJECT No.	CONTROL	Rev.	FIGURE
166-8623	-	1	5

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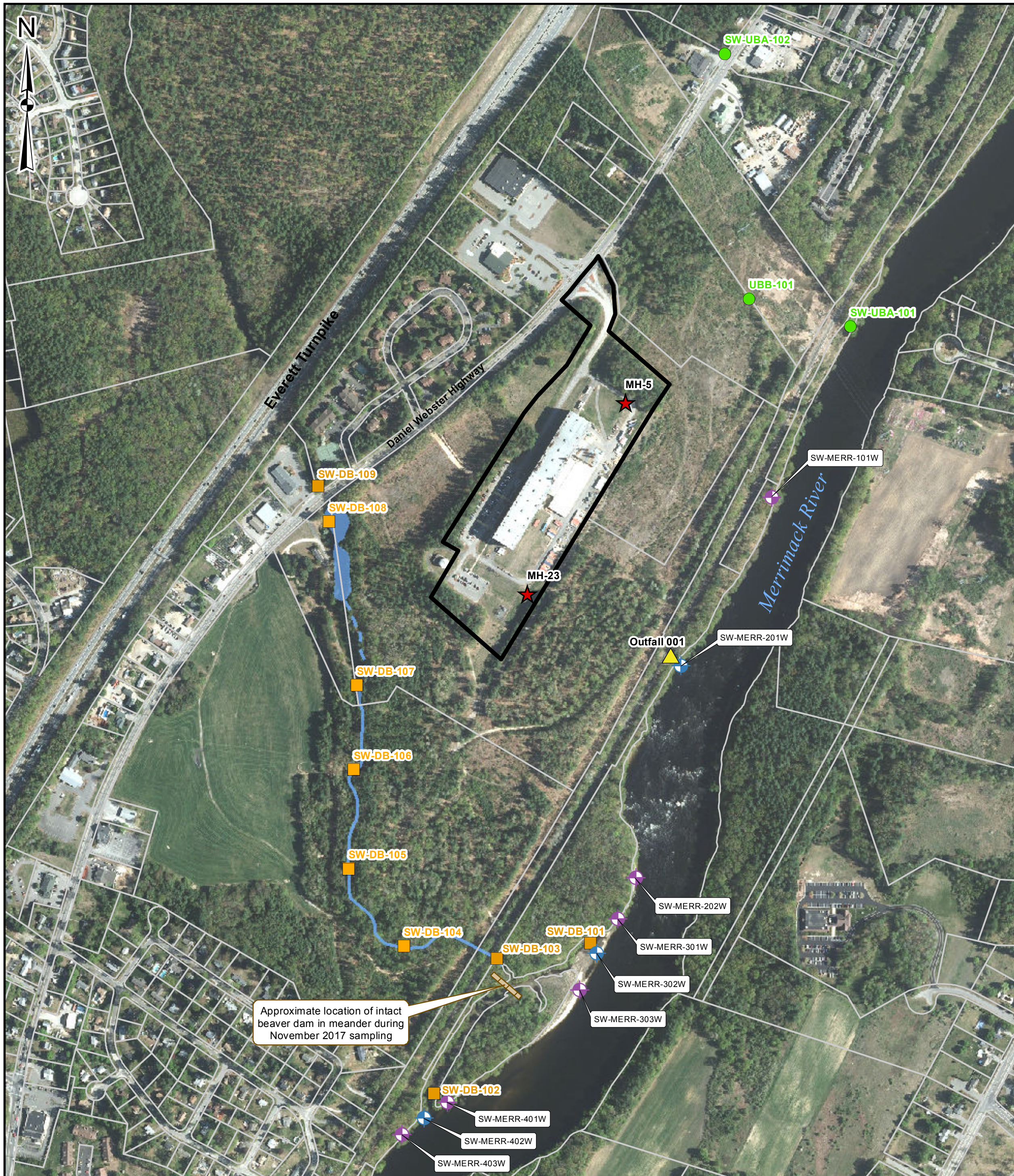

LEGEND

- Manhole Sampling Location
- Outfall Sampling Location
- Unnamed Brook Sample Location
- Merrimack River Near Shore (<5 ft from shore) and Channel (>5 ft from shore) Sampling Location
- Merrimack River Near Shore Sampling Location
- Dumpling Brook and River Meander Sampling Location
- Dumpling Brook
- Dumpling Brook - Underground
- Approximate SGPP Facility Boundary
- Beaver Dam

0 400 800 Feet

REFERENCE

2015 IMAGERY DOWNLOADED FROM NH GRANIT WEBSITE

CLIENT
SAINT-GOBAIN PERFORMANCE PLASTICS

PROJECT
SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY
MERRIMACK, NH

TITLE
FACILITY, MERRIMACK RIVER, DUMPLING BROOK, AND UNNAMED BROOK SAMPLING LOCATIONS

CONSULTANT

GOLDER

YYYY-MM-DD	3/14/2019
PREPARED	SHL
DESIGN	STD
REVIEW	RWB
APPROVED	APTM

PROJECT No.	CONTROL	Rev.	FIGURE
166-8623	-	0	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

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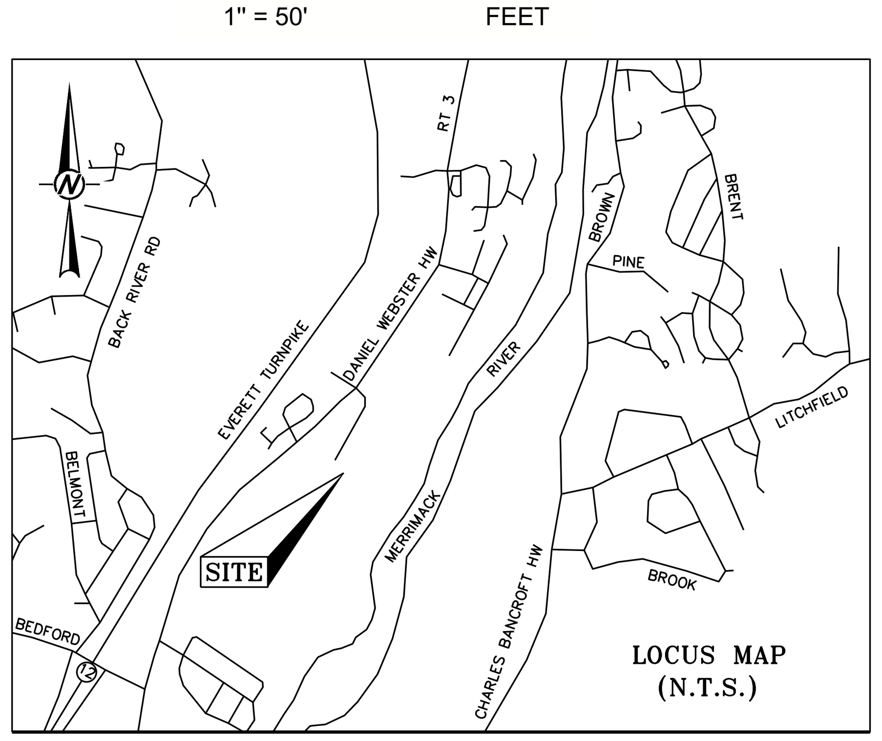

LEGEND

- IRF IRON ROD FOUND
- CULVERT
- POST
- TBM TEMPORARY BENCHMARK
- SB STONE BOUND FOUND
- MONITORING WELL
- OFF-PROPERTY MONITORING WELL
- CATCH BASIN
- ROUND CATCH BASIN
- UNKNOWN MANHOLE
- DRAIN MANHOLE
- EXTERIOR ROOF DRAIN DOWNSPOUT
- SEWER MANHOLE
- BOLLARD
- FIRE HYDRANT
- CHAIN LINK FENCE
- PROPERTY LINE
- STORMWATER CONVEYANCE SYSTEM
- ROOF DRAIN LINE (ABOVE GROUND)
- SANITARY SEWER LINE

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SAMPLING LOCATIONS:

- ROOF DRAIN VERTICAL PIPING PORTS
- UPSTREAM CATCH BASIN/DRAIN INLETS
- LOCATIONS OF STORMWATER FLOW FROM OFF PROPERTY
- MH-23, MH-5, AND OUTFALL 001

PLAN REFERENCES

1. PLAN ENTITLED "SUBDIVISION PLAN (MAP 6E, LOT 3-4), MERRIMACK COMMERCE PARK, DANIEL WEBSTER HIGHWAY, MERRIMACK, NEW HAMPSHIRE, PREPARED FOR JOHN J. FLATELY COMPANY." DATED NOVEMBER 3, 2012. PREPARED BY HAYNER/ SWANSON, INC. PLAN ON RECORD AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN No. 37652.

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CLIENT
SAINT-GOBAIN PERFORMANCE PLASTICS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-25
DESIGNED	SD
PREPARED	RWC
REVIEWED	RWB
APPROVED	APTM

PROJECT
SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY
MERRIMACK, NEW HAMPSHIRE

TITLE
STORMWATER CONVEYANCE SYSTEM SOURCE ELEVATION SAMPLING LOCATIONS

PROJECT NO.	CONTROL	REV.	FIGURE
1668623	03	0	7

Path: V:\001 GIS Projects\2016\SaintGobain\1668623_SG_Merrimack\SaintGobain_MerrimackNH\99_PROJECTS\1668623_PFOS_PFOA_Sampling\6_Stream_Sampling\02_PRODUCTION\MXD\166-8623_StreamSamplingLocations_SedimentSampleMap.mxd

LEGEND

Approximate SGPP Facility Boundary

Upstream Sediment Sample

0 0.5 1
Miles

REFERENCE

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
SAINT-GOBAIN PERFORMANCE PLASTICS

PROJECT
SAINT-GOBAIN PERFORMANCE PLASTICS
701 DANIEL WEBSTER HIGHWAY
MERRIMACK, NH

TITLE
LOCATION OF UPSTREAM SEDIMENT SAMPLE

CONSULTANT

GOLDER

YYYY-MM-DD	2/27/2019
PREPARED	SHL
DESIGN	STD
REVIEW	RWB
APPROVED	APTM

PROJECT No.	CONTROL	Rev.	FIGURE
166-8623	-	0	8

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI A

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APPENDICES - SEE VOLUME II

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