Intended for
Revitalizing Auto Communities Environmental Response Trust (RACER Trust)

Final Report

March 2023

SEWER REHABILITATION COMPLETION REPORT

RACER TRUST - COLDWATER ROAD FACILITY, GENESEE TOWNSHIP, MICHIGAN

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Project name	**Sewer Rehabilitation Completion Report**
Project no.	**1940103462**
Recipient	**RACER Trust**
Document type	**Final Report**
Date	**March 15, 2023**
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1. INTRODUCTION

Ramboll Americas Engineering Solutions, Inc. (Ramboll) was retained by Revitalizing Auto Communities Environmental Response Trust (RACER Trust) for technical support and oversight of repairs/rehabilitation of sewers and manholes west of the Coldwater Road Facility (Site), Genesee Township, Michigan. The location of the facility is shown on the attached site location map (**Figure 1**).

The following report is a summary of the pre-project activities, permitting, and rehabilitation activities that were completed between September 2021 and February 2022. Additional supplemental rehabilitation activities were conducted in March 2023 as a supplement to the activities completed in February 2022.

There have been additional sample collection and corrective measures completed within the sewer system adjacent to the Site which are not associated with the sewer lining activities summarized within this report and therefore, have not been included in this report.

The intent of this report is to:

- Document the rehabilitation activities for record purposes and verification of compliance with the approved plans and permits.

- Provide a summary of the rehabilitation activities completed by the project team and RACER Trust for recording and regulatory submittals.

1.1 Background

The RACER Coldwater Road Facility consists of approximately 117 acres located at 6220 Horton Street in Genesee Township, Michigan.

Current features at the Site include an approximately 20-acre Resource Conservation and Recovery Act (RCRA) hazardous waste landfill, which has been closed since 1994; vacant land; ponds, which are ringed by delineated wetlands; and a leachate accumulation facility, which stores accumulated leachate and other water removed from the landfill.

The Site was formerly used for wastewater treatment for plating wastes from the adjacent former General Motors Corporation (GMC) plant and included a former treatment building, settling basins, dewatering lagoons, and landfarming of sludge.

Extensive sludge and soil excavation at the Site were completed in 1994 and several RCRA Solid Waste Management Units (SWMUs) were closed between 1994 and 2003. Most sludges and soils were stabilized and placed in the on-site landfill, but some soils were transported off-Site for disposal.

As a result of post-remediation restoration three ponds (referred to as the Eastern, Middle, and Western Ponds), which are ringed by wetlands were created within the northern portion of the Site. GMC created the ponds to manage stormwater runoff and were generally constructed on the

finished grades following excavation of sludges/soil from this area (*i.e.*, were constructed on the generally clayey soils making up the substrate across much of the Site).

Due to the potential prior use of mist suppressant chemicals containing per- and polyfluoroalkyl substances (collectively, PFAS) as part of the former plating processes performed at the adjacent former plant and the presence of PFAS in the wastewater and wastewater treatment residuals, investigation of PFAS at the Site was initiated in 2016.

Since 2016, RACER has been completing investigations at the Site under the oversight of the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Those investigations have confirmed the presence of PFAS (specifically perfluorooctane sulfonic acid [PFOS]) impacted groundwater at the Site. The completed groundwater investigations indicated areas where impacted groundwater may be in contact with sewers west of the Site.

RACER Trust has implemented multiple corrective measures, including stormwater management improvements, at the Site since 2017 to minimize off-Site discharge of impacted storm water to the waters of the State of Michigan.

2. PROJECT OVERVIEW

2.1 Project Timeline

Rehabilitation activities began with the project kickoff in September 2021 and ended in February 2022, after a break during winter due to weather conditions.

The following table is a summary of the main phases of work undertaken to complete the project and the key (approximate) dates of starting and completing the various phases.

Summary of Construction Project Schedule

Permitting, Submittals and Approvals		Construction Activities		Site Restoration[2]	
Start	**End**	**Start**	**End[1]**	**Start**	**End**
8/10/2021	11/19/2021	9/21/2021	2/22/2022	11/10/2021	9/6/2022
Supplemental Activites[3]:		3/1/2023	3/1/2023	N/A	N/A

Notes:

1 – The work was originally scheduled to be completed by the end of December 2021 but was not completed until late February 2022. Several factors delayed the completion of the lining work including permitting, Ramboll's receipt of and approval of the submittals required from the contractor (in particular the lateral lining designs), the availability of materials, and inclement weather (freezing conditions).

2 – Site restoration was considered completed once the final sealing of manholes MH-18A and MH-18B was completed on September 6, 2022. Following lining, these two manholes leaked at the liner/manhole interface and required sealing. Due to freezing conditions in February 2022 and then standing water surrounding these manholes until late June 2022 these repairs were delayed. The repairs were further delayed due to contractor availability.

3 – The three laterals reinstated for Empty Lot B through Empty Lot D on Temple Avenue were sealed using three full pipe liner segments (i.e., "patches") on March 1, 2023.

2.2 Sewer Rehabilitation Project Team

Ramboll was the Design Engineer and oversaw the construction activities for RACER Trust for the construction program and provided part-time on-site inspection and documentation. Other major team members consisted of:

- Puris Corporation, formerly Granite Inliner, LLC (Granite). Granite was purchased by the Puris Corporation subsequent to the completion of the construction activities – Sewer rehabilitation prime contractor
- Monchilov Sewer Service, LLC (Monchilov) – Sewer rehabilitation subcontractor
- BLD Services, LLC (BLD) – Sewer lateral rehabilitation subcontractor

2.3 Submittals and Approvals

The work was completed in accordance with the Sewer Rehabilitation (Lining) Scope of Work (SOW) letter provided to EGLE on December 23, 2020 and approved via email on January 29, 2021 and the Sewer Rehabilitation Task 1A Memo provided to EGLE and Beecher Metropolitan District on January 28, 2021.

BMD provided its general permission for RACER to access its sanitary sewer lines and manholes for activities such as cleaning, videoing, observing, sealing and/or lining in an Access Agreement with RACER effective September 8, 2020, and was provided in the detailed SOW.

The following submittals and approvals were required as part of the lining work:

- Performance and payment bonds
- Contractor's Safe Work Plan (SWP)
- Preliminary and final progress schedules, and subsequent revisions thereof
- Wastewater handling plan for any wastewater generated during the work
- Name and location of the MDOT approved source of the fill material used during the sewer point repair
- Manufacturer's certification or other documentation that materials furnished for the lining work were in compliance with the applicable requirements of the project specifications and standards referenced in the project specifications
- Thickness design calculations in accordance with ASTM F 1216 or manufacturer's recommendations, including initial flexural strength and modulus of elasticity used on the project and supporting 3rd party test data
- Field verification of the internal diameter and length for each installation prior to performing work
- Wet out records, including resin and catalyst type, quantity, mix ratio, tube length and project data
- A curing protocol in compliance with the project specifications and the manufacturer's recommendations and applicable ASTM standards
- Name and documentation for the hydrophilic waterstop, or equal, proposed for sealing the mainline connection at each manhole
- Pipeline Assessment Certification Program (PACP®) certifications of closed-circuit television (CCTV) operators who performed the work.
- Pre-Installation (lining) CCTV Inspection videos and Inspection Logs
- Post-Installation (lining) CCTV Inspection videos and Inspection Logs.

2.4 Permitting

Granite was required to obtain the proper permits for the work to be conducted. Steps were taken to ensure that the necessary permitting was submitted and approved prior to the work being conducted. Granite identified five permits that may have been applicable to the work that was to be conducted:

Right-of-Way Permit

A Genesee County Road Commission (GCRC) Right-of-Way (ROW) Permit (Permit #: 2021R0872) was submitted on September 16, 2021 through the Genesee County Road Commission permit application process. GCRC issued the permit on October 12, 2021. The ROW Permit was issued under the Public Highways and Private Roads Act, 1909 Public Act 283, Section 224.19b. The permit was closes on October 12, 2022.

Genesee County Road Commission Permit

Granite submitted the GCRC ROW permit on September 16, 2021 and it was approved October 12, 2021. The permit allowed the cleaning and lining of sanitary and storm sewers in the county

right of way, rehabilitation of manholes, and the excavation of part of Temple Avenue due to sewer pipe replacement.

Beecher Metropolitan District (BMD) Water Permit
BMD Sewer and Water did not require a permit because the scope of work was improving the BMD sewer pipe network. A representative from BMD would periodically inspect the work that was conducted as well as the sewer replacement on Temple Avenue prior to backfilling. Due to BMD's involvement with the project a water permit was not needed.

Michigan Utility Notification Center (MISS DIG System)
Prior to completing the excavation for the spot repair, the Michigan Utility Notification Center (MISS DIG System) was called to locate public utilities that might be encountered. Other than the sewer line being repaired no other public utilities were identified within the spot repair excavation.

Michigan Department of Transportation (MDOT) Traffic Permit
A separate MDOT Permit was not required for the project. The work within the roadway was covered under the GCRC ROW permit, which specified that traffic control must comply with Part 6 of the current Michigan Manual of Uniform Traffic Control Devices (MMUTCD). MDOT guidelines were followed during project activities.

Soil Erosion and Sediment Control (SESC) Permit
An SESC permit was not required, as less than an acre of ground surface was disturbed during the project, and the activities were not within 500 feet of a lake or stream. due to the project disturbing less than an acre of ground surface and that it did not involve earth change activities within 500 feet of a lake or stream.

Disposal Permit
The Disposal Permit was not required for this project because the soil and excess earthwork was relocated on-site. The excavated and stockpiled material was sampled, and those results are discussed further in Section 6.

2.5 Project Safety

Project safety was a critical consideration of the sewer rehabilitation project team. An overall project Health and Safety Plan (HASP) was compiled by Ramboll. As mentioned in Section 2.3 Granite was required to create their own SWP. The HASP was communicated to site workers and the subcontractors on the job along with Granite's SWP.

Ramboll and/or Granite conducted job-safety analysis (JSA) briefings (or "tool box meetings") daily. Safety summaries were provided and discussed during routine, typically weekly, progress meetings conducted throughout the performance of the field work.

The project work zones were designated with the use of high-visibility traffic cones to keep the general public out of the work zones.

In addition to contacting the MISS DIG System to mark the location of underground utilities within the spot repair excavation, care was also taken to avoid overhead power lines, especially the residential drops that were close to the manhole locations within the work area.

3. PROJECT DATA REVIEW

This section summarizes the desktop data analysis and field confirmation activities that were performed to identify any missing information relevant to the sewer lining design completion.

3.1 Desktop Data Review

A detailed review of documentation pertaining to the Site conditions was performed for the project. This was done to supplement the sewer condition information that had already been assessed. Upon completion of the data review, the following items were reported to BMD and EGLE in a memorandum (i.e., Task 1A memo mentioned earlier) on January 28, 2021:

- Assessment of sewer condition information
- Listing of property owners requiring coordination as identified from GIS parcel and BMD data
- Preliminary list of applicable permits
- Potential utility conflicts (e.g. water, stormwater, gas, etc.) identified from record drawings or Miss Dig
- Recommendations for follow-up field inspection and confirmation activities.

3.2 Field Inspection & Confirmation Activities

To inventory the sewers and manholes, an evaluation of the current conditions was conducted. If the sewers and manholes were not in reasonably good condition, in other words, if they were collapsed, broken, and/or off-set or otherwise in disrepair, then lining that portion may not have been feasible.

The first task in the assessment was to have the foreign materials (sediment, grease, broken pipe, roots, calcium deposits, etc.) flushed/removed from the lines using hydraulic high-pressure sewer cleaners and cutting tools, as necessary, specifically designed and constructed for such cleaning.

Once a section of the sewer had been properly cleaned, the section was inspected using CCTV equipment. The sewer sections proposed for inspection/evaluation were based on the results of the samples from sanitary sewer manholes and the interpreted extent of PFOS groundwater impacts.

The inspection was performed one pipe section at a time and the flow in the section being inspected was suitably isolated from the remainder of the sanitary sewer system as required. The isolation of the sewer was initiated for a short time and did not require bypass pumping as the sewer had enough storage capacity for the several hours the CCTV work was conducted. The manhole risers were visually inspected during the performance of the other inspection activities to evaluate the current conditions of the manholes.

The data gathered during the sewer cleaning and CCTV inspection activities was evaluated to determine if lining was a cost-effective corrective measure to mitigate PFAS impacts infiltrating into the sewer system, including manholes. The results of the evaluation were presented to EGLE and the municipalities for consideration.

The configuration of the sewer laterals was needed to more accurately document for lining. Therefore, the location of each cleanout for the affected properties was needed to identify the associated distance to the mainline sewer. Attempts were made to visually locate cleanouts but without success. Therefore, to avoid delaying the design of the lining system the distances were estimated in GIS from aerial photos.

A summary of the additional field inspection activities and updated figures showing the approximate lateral locations were provided in the Task 1A memo provided to EGLE and BMD on January 28, 2021.

Manhole depths and dimensions were also documented. This information enhanced the rehabilitation approach for both the point repair excavation and sewer and lateral lining. The information was collected by taking measurements with a steel tape placed in the invert of each manhole.

A summary of the sewer depths and groundwater elevation comparison are provided below:

- Sanitary Sewer Burial Depth vs. Groundwater Elevation Evaluation:
    - The 6” PVC sanitary sewer servicing the Site building is generally above the water table. It may be close to the water table at the border of the Site just before it joins the off-site sanitary sewer.
    - Sanitary sewers off site generally appear to be above the groundwater table, except for the eastern 100 to 150 feet of the sanitary sewers along Morris Hills Parkway, Temple Avenue, and Hartman Street; and the eastern 400 feet of the sanitary sewer along Dunkirk.
- Storm Sewer Burial Depth vs. Groundwater Elevation Evaluation:
    - The on-Site storm sewer line that runs diagonally from MH-18C to MH-18 near the western property boundary is generally below the groundwater table (at least for the shallowest water bearing zones of the perched zone and was included in the lining activities).
    - Storm sewers along a section of Saginaw Road immediately west of monitoring well OBG MW-26 that contained PFOS above its water quality value appear to be below the top of the shallow water bearing (Perched) zone in this area of the Site and was included in the lining activities.

3.3 Preparation of Bid Documents

A design and technical specification package including the 90% (draft) and final bid ready contract documents consisting of contract drawings, contract bid schedule, and technical specifications were submitted to the BMD and EGLE on April 28, 2021 and released to perspective bidders on May 26, 2021.

The contract drawings were developed using GIS and supplemental information acquired from as-built drawings, utility drawings, and the Site visits performed.

4. DETAILS OF CONSTRUCTION

This section details the repairs/rehabilitation of sewers and manholes west of the Site and procedures for completing these tasks.

4.1 Project Documentation

As the design engineer for the program, Ramboll provided part-time on-site oversight during the repair and rehabilitation activities. Notes were maintained by Ramboll and project status was communicated to RACER weekly. Copies of the notes and weekly reports are available upon request.

The Sewer Rehab Weekly Progress Reports were submitted with an updated schedule and included work completed the previous week, work to be performed for the coming week, inspections, project issues to report/events affecting activities, delays, subcontractors, and visitors on-site.

Photographs were taken during the construction project to document the work. Select photographs have been incorporated into a photographic log which is provided as **Appendix A**.

4.2 Property Ownership Evaluation and Notification

The available parcel/property ownership information was collected for within the recommended work area and evaluated prior to the lining activities. Approximately 70 parcels were within the recommended work area associated with the sanitary sewer rehabilitation work.

Immediately prior to lining, the sewer was isolated from use, which required some coordination with the affected residents. A flyer detailing the work to be done was passed out door to door approximately 24-hours ahead of the lining activities to notify the residents. No residents were affected by the storm water rehabilitation work.

4.3 Pipe Preparation and Inspection

Prior to rehabilitation, a video survey and cleaning were conducted by Monchilov, who was subcontracted by Granite. A portable camera device was passed through each section of main lines to be rehabilitated and a high-pressure water jet was used to remove any debris or obstructions to the lining process. If roots or excessive mineralization were observed, a remote-controlled reaming device was utilized for removal.

Video recordings of the inspections and cleaning were saved and subsequently reviewed by Granite and Ramboll prior to rehabilitation work. The video survey indicated that the sewer pipes were in adequate condition to allow lining without such repairs.

4.4 Manhole Lining

Monchilov conducted the sealing/coating that occurred in nine sanitary sewer manholes (MH-1, MH-2, MH-4, MH-5, MH-7, MH-8, MH-11, MH-13, and MH-14), three off-site storm sewer manholes (SS-07, SS-08, and SS-09), and three on-site storm sewer manholes (MH-18A, MH-18B, and MH-18C). See Appendix B As-Built Plan View Drawings for further detail Appendix B

Prior to coating/lining the manholes, manhole joints, cracks, and pipe connections were repaired to prevent infiltration. Chemical grout was applied to the exterior manhole surfaces by drilling holes in approximately two-foot intervals around the entire depth of manhole wall on joints that were leaking. The chemical grout was applied through threaded connections into lower holes until grout freely flowed to the next set of holes establishing a grout zone on the outside of the manholes.

Manholes were then lined using a cement-based, fiber reinforced calcium aluminate mortar specifically designed to prevent infiltration and restore structural integrity. The cement-based material was formulated to withstand hydrogen sulfide bacterial corrosion and abrasion in municipal sanitary sewers. Each manhole was cleaned prior to the application of cement material using a 360-degree spraying nozzle. As space permitted, the sprayed-on material was smoothed out with a damp sponge to ensure a better seal.

After lining the storm sewer lines between manholes MH-18A and MH-18B leaking at the liner/manhole interface was observed, indicating the hydrophilic waterstop sealant (caulk-like material) utilized by Granite during the lining process was not sufficient to seal the liner to these manholes. These leaks were caused by the uneven surface at the liner manhole interface which typically is sealed by the waterstop, but in this case the gaps caused by the uneven surfaces at the interfaces were too large for the waterstop to be affective. Therefore, RACER Trust and Ramboll asked Granite to reevaluate and propose a solution. It was decided to have Monchilov seal the liner to the manhole using the same materials used to seal the manholes.

4.5 Sewer Spot Repair

A spot repair (aka, point repair) was conducted on the sanitary sewer main line along Temple Avenue at the upgradient end of MH-5, due to the observation of multiple holes and fractures within an approximate 12-foot section of the sewer pipe.

The designated area was excavated, and soil, gravel, and asphalt (i.e., excavated material) was removed and stockpiled. A trench box was utilized to comply with the Occupational Safety and Health Administration (OSHA) excavation safety regulations found in 29 CFR Part 1926.650 through 1926.652 Subpart P-Excavations, including rules on the installation and use of trench boxes as a shielding method to comply with OSHA sloping, shoring, or shielding requirements for an excavation. This method was selected to minimize the disturbance of Temple Avenue and due to the approximate 10 feet depth of the excavation.

The damaged portion of the existing vitrified clay pipe (VCP) main line was replaced utilizing a 12-foot section of 10-inch diameter polyvinyl chloride (PVC) pipe and reconnected to the existing manhole utilizing a Press-Seal Corporation PSX: direct drive high-performance flexible pipe-to-manhole connector.

The excavation material was not used to backfill the excavation and was stockpiled on-site. Approximately 36 yards of soil material was placed on-site, and a sample was collected for characterization purposes. The sample results are discussed further in Section 6.

The excavation was backfilled in accordance with the project specifications, with modifications approved by RACER Trust and Ramboll, utilizing materials obtained from StoneCo of Michigan a

MDOT approved source for road construction materials. In consultation with RACER Trust, Ramboll approved the use of MDOT 34R aggregate for bedding material instead of granular material Class IIIA in accordance with Chapter 401 of MDOT 2020 Standard Specifications for Construction for undercutting due to unstable soil conditions.

Approximately 6 inches of MDOT 34R aggregate was utilized as bedding material beneath the new section of PVC sewer pipe and was used to fill the excavation to a height of at least 1 foot above the new sewer pipe. The remainder of the excavation was backfilled to within 13.5 inches of the existing road surface with Class III granular material. The backfilled material was properly compacted and tested to confirm compaction.

After compaction, the pavement road surface was properly restored to existing conditions including seven inches of 21AA road base (sub-base) material placed above the Class III granular material, followed by 6.5 inches of asphalt utilized to repair the existing pavement which was removed to conduct the excavation activities.

4.6 Lateral Pipe Preparation and Inspection

Lateral pipe preparation included similar tasks to main line preparation and was conducted by BLD. During the main lining preparation, video was collected to determine the status, quality, and size of the laterals to be rehabilitated.

The videos were reviewed by Ramboll, RACER, Granite, and BLD to determine the feasibility of rehabilitation and the need for rehabilitation based on the occupancy of the associated parcel. Lateral liners were then installed in all laterals deemed to be in sufficient condition and length. However, several laterals were not able to be lined from within the sewer mains due to their configuration, including several lateral connections consisting of 4- or 6-inch diameter cast iron tees that would require the lateral liner to bend 90 degrees, which was attempted and could not be completed.

Table 1 provides a summary of the laterals considered for lining and those that were completed and a summary of those that were not completed and the reasons for not completing the lining.

4.7 Main Liner Installation

Main liners were installed in eleven sections of storm and sanitary main lines by Granite. Sanitary sewer sections were lined along Dunkirk Avenue, Hartman Avenue, Temple Avenue, and Morris Hill Parkway. Storm sewer sections were lined along Saginaw Road (along the Western portion of the site) and from MH-18 to MH-18C onsite.

Prior to commencing the sewer main lining installation work, Granite submitted to Ramboll for approval design calculations specifying the appropriate liner thickness for the various sewer lining sections based on the sewer diameter, burial depth, hydrostatic pressure, etc. in accordance with ASTM F 1216, including specifying the initial flexural strength and modulus of elasticity that would be used on the project. Ramboll engineers reviewed the designs, and the final accepted designs were utilized for the project.

Each section of main liner was installed between two manholes. The Lining activities were conducted utilizing cured-in-place pipe (CIPP) techniques consisting of thermosetting resin

impregnated flexible felt tubes inserted into the existing sewer line. Once inserted, the resin was cured to provide a continuous pipe liner that fits tightly along the entire circumference and length of the host pipe.

Lining was accomplished by impregnating (i.e., saturating) the felt tube (liner) with the thermosetting resin (a polyurea resin manufactured by OBIC LLC), followed by inserting the resin-saturated liners into the sewers by first turning the liner inside out and attaching it to a banding cone. Air was then injected into the liner to create pressure and force the liner through (into) the sewer main while turning it itself right-side out.

As the liners were inflated and traveled along the length of the main line, the air pressure pushed the liners tightly against the original main line. Once the liners were in place, steam was then pressurized down the line to keep the liner tight against the original pipe and to increase the temperature of the line to fully complete the curing process. The curing process takes a few hours to complete.

Granite utilized a thermal imaging system (TIS) to monitor the curing process along the entire length of the liner segment utilizing their fiber optic technology to monitor the curing temperatures at 6-inch intervals along the entire length of the liner. After the curing process was complete, a video was taken to confirm the proper installation of the main liner. Wet out records, including resin and catalyst type, quantity, mix ratio, tube (liner) length and project data were provided to allow Ramboll to review as a quality control measure.

Laterals were then reinstated (i.e., put back into service) by deploying a remote-controlled cutting device and camera system into the sewer main and utilizing it to cut out the liner where laterals connect to the main sewer to allow flow into the sewer main from the laterals and to allow the installation of lateral liners.

Several dead end (capped or otherwise decommissioned) and/or no longer utilized laterals (such as laterals leading to empty lots) were not reinstated because their connection to the sewer main was not needed and to avoid allowing groundwater or infiltration that could contain PFAS to enter the sewer main (see **Table 1**).

In addition, a watertight seal between the CIPP and the host pipe at the pipe penetration at each manhole was made using a hydrophilic waterstop. As indicated previously, the liner manhole interfaces were noted to be leaking at manholes MH-18A and MH-18B; therefore, Monchilov used the same cementitious material utilized to seal the manholes to seal these leaks.

4.8 Lateral Liner Installation

Lateral liners were installed in 33 laterals of the 54 laterals within the project area by BLD. Eleven laterals were lined on Dunkirk Avenue, eight laterals on Hartman Avenue, five laterals on Temple Avenue, and nine laterals on Morris Hills Parkway. Three lateral spot repairs were conducted on Temple Avenue within the main sewer spot repair area as well. Two short lateral repairs (also noted as lateral spot repairs in **Table 1** were conducted).

Laterals were accessed through manholes within the main lines. BLD utilized a time-based resin curing process within the liners. A sleeve containing the inside out liner with the resin applied

was equipped to a line that traversed the main line. The sleeve was then positioned adjacent to the appropriate lateral hole and air pressure was used to inflate the liner into the lateral and the laterals were then allowed to cure for the appropriate amount of time.

The below laterals were not lined due to the reasons provided. Additional information on the laterals which were not completed can be found in **Table 1** and **Appendix B**:

- Laterals leading to empty lots, were not generally intended to be reinstated. It appears that several of these laterals were reinstated and, in some cases, may be allowing in flow to the sewer main. Three such reinstated unlined laterals were the laterals leading to Empty Lot B through Empty Lot D on Temple Avenue were observed to be flowing. These laterals were sealed off using a full pipe liner segments (i.e., "patches") for each of the laterals on March 1, 2023.
- 4" and/or 6" cast iron tees making the connection from the lateral to the sewer main that could not be lined due to the configuration (quick 90-degree bends). There were additional configuration issues, such as a double lateral connection (splitting off to a side service from the single connection to the main). These laterals will be reevaluated for repair if the analytical results do not continue to remain near or below water quality values.
- A lateral was missed at 1109A Dunkirk Avenue that is to a house between house addresses 1109 Dunkirk and 1119 Dunkirk. It was not shown on the drawing and does not appear to show up in the Project Status and pre-lining assessment spreadsheet. The location of this lateral is far enough west to be above the water table and therefore, currently is not scheduled for repair.
- Lateral R-11 shown on Drawing C-01 of the design drawing set that is associated with a house with the address of 1160 Dunkirk Avenue. This lateral was noted as an Empty Lot (in Row 71 in spreadsheet CCTV Inspections) and was missed during the lining activities. Scheduling of lining this lateral is in progress.

4.9 Physical Testing

HTS Pipe Consultant received eight samples of CIPP to test the short-term flexural and tensile properties to verify the lining has adequate strength and flexibility to withstand overhead traffic and other subsurface conditions to which it could be subjected. The physical properties were tested in accordance with ASTM F1216 Section 8.1. The samples were collected corresponding to the following liner sections:

- Dunkirk between manholes 11-12, 12-13, and 13-14,
- Hartman between manholes 7-8,
- Temple between manholes 4-5,
- Morris Hills between manholes 1-2,
- On-site storm sewer between manholes 18A-18, and 18A-18B-18C.

The samples were tested in accordance with ASTM D790, Method I, Procedure A. A Support Span-to-Depth Ratio of 16 to 1 was used as specified in the test standard. Thickness measurements, flexural stress, and flexural modulus of elasticity tests were performed on each sample. Five specimens were cut and tested from each sample. The test results were reviewed by a Ramboll engineer and found to be acceptable.

The thickness test result was less than the calculated thickness submitted by the contractor for the on-site storm sewer between manholes 18C-18B. However, the measured thickness was

determined to be acceptable based on the actual flexural modulus and flexural strength, which were higher than the project specifications and indicate that a thinner liner would meet the design strengths required for the project. Additional testing results for samples collected on the liner along Saginaw Road were overlooked for testing and were only recently submitted for testing. These results will be documented in an email following receipt. The available results of the physical test can be found in **Appendix C**.

5. SEWER SAMPLING METHODS

This section details of the sample locations within the sewer system, the collection process for the sewer samples collected west of the Site, and field observations.

5.1 Sanitary Sewer Locations

Due to infiltrating groundwater in portions of the sanitary sewers west of the Site, samples were collected to evaluate for the presence of PFOS.

From November 2019 to December 2022, PFAS samples have been collected at thirteen locations from the BMD sewer system west of the Site to evaluate/delineate elevated PFOS results (**Figure 2**).

- SAN-03 – located at the east end of Dunkirk Avenue to evaluate whether there were PFAS impacts within the sewer.
- SAN-4 – located at the east end of Hartman Street to evaluate whether there were PFAS impacts within the sewer.
- SAN-5 – located along Temple Avenue to evaluate PFAS concentrations west of the Site and outside of the PFAS impacted groundwater area.
- SAN-06 – located on the east side of Saginaw Road south of Klein Road to evaluate the combined flow (concentration) from the sanitary sewers emanating from Chrysler Street and Dunkirk Avenue.
- SAN-07 – located just south of Dunkirk Avenue from the sewer that services residences along Chrysler Street west of the Site to evaluate whether there were PFAS impacts within this sewer, which is located outside of PFAS-impacts groundwater at the Site.
- SAN-10 – located at the west end of Dunkirk Avenue, downstream west of SAN-03 to evaluate PFAS concentrations further downstream within this sewer.
- SAN-11 – located at the west end of Hartman Street west of SAN-4.
- San-12 – located along Hartman Street to evaluate the combined flow from Hartman Street and Temple Avenue before the combined sewer goes under I-475.
- SAN-13 – located at the west end of Temple Avenue west of SAN-5.
- SAN-14 – located along Morris Hills Parkway from the combined flow from the sewer along Morris Hills Parkway and the three short streets south of Morris Hills Parkway east of I-475.
- SAN-15 – located at the west end of Morris Hills Parkway to evaluate whether there were PFAS impacts within the sewer.
- SAN-16 – located along Dowagiac Avenue southwest of the PFAS impacts identified at the Site to evaluate background conditions.
- SAN-17 – located along Terry Avenue southwest of the PFAS impacts identified at Site to evaluate background conditions.

Since the lining was completed in February of 2022 PFAS samples have primarily been collected from SAN-06, SAN-12, and SAN-14, which are the last manholes east of I-475 before the sanitary sewer system continues further from the neighborhood and Site to the west.

5.2 Storm Sewer Locations

Due to infiltrating groundwater in portions of the on-Site storm sewer and the storm sewer along the east side of Saginaw Road, samples were collected to evaluate for the presence of PFOS. Additional samples have been collected from the storm sewers west of the Site which are not associated with the sewer lining activities and therefore, have not been included in this report.

From November 2019 to January 2023, PFAS samples have been collected at three locations to evaluate/delineate elevated PFOS results (**Figure 3**).

- SS-06 – located within the vault at the northeast corner of Saginaw Road and Klein Street from the water flowing from the north to the south.
- SS-10 – located within the manhole north of Klein Street on the east side of Saginaw Road to evaluate the flow coming from the north. This location is used as a replacement for SS-06. Due to the configuration of the vault and where the storm water entered from the north, it made collection of a representative sample more difficult.
- MH-18 – (if flowing) located on the RACER Coldwater Road property at the corner of Klein and Saginaw Street. No flowing water has been observed within the manhole from the storm sewer line since the lining and manhole (MH-18A & MH-18B) sealing were completed.

5.3 Sample Collection Process

Sewer sample collection was performed in accordance with the methods specified in EGLE's Wastewater PFAS Sampling Guidance and Ramboll PFAS Sampling Field Guidance Document (March 2022). Special care was taken during sampling and transport of the samples to avoid cross-contamination from clothing, sampling materials, and storage containers due to the extremely low detection limits for PFAS (<1 ng/L).

Personnel did not enter confined space areas (manholes) and samples were collected remotely. The sewer samples were collected by first removing the manhole covers followed by lowering high density polyethylene (HDPE) tubing into the manhole to below the liquid surface, and the sample was collected from the sewer using a peristaltic pump. New tubing was used at each location to ensure no cross-contamination occurred.

The samples were labeled, packed on ice, and shipped via courier under routine chain-of-custody protocols to Merit Laboratories, Inc. (Merit) of East Lansing, Michigan. The sewer samples were analyzed for PFAS by method ASTMD7979-19 (no preservative).

5.4 Field Observations

Since the completion of the repairs/rehabilitation of sewers and manholes a reduction in the quantity of flowing liquid has been observed during sample collection.

There are two monitoring wells, OBG MW-13 and OBG MW-25, in proximity to the sanitary sewers which were lined that have seen a rise in the static groundwater elevation since the repairs/rehabilitation were complete. This was expected due to the observed reduction in the quantity of groundwater infiltrating the sewer system. OBG MW-13 is located along Temple Avenue and OBG MW-24 is located along Dunkirk Avenue. The below table shows the change in static groundwater elevation from 2019 to 2022.

		May 28, 2019		November 20, 2019		June 8, 2022		October 31, 2022	
Well ID	Top of Casing Elevation (ft)*	Depth to Water (ft)	Static Water Elevation (ft)	Depth to Water (ft)	Static Water Elevation (ft)	Depth to Water (ft)	Static Water Elevation (ft)	Depth to Water (ft)	Static Water Elevation (ft)
OBG MW-13	801.81	14.71	787.10	11.66	790.15	5.32	796.49	7.28	794.53
OBG MW-24	781.50	4.76	776.74	6.65	774.85	3.35	778.15	1.71	779.79

Notes

Casing elevations were provided by Norwy & Hale Surveyors and are in feet relative to National Geodetic Vertical Datum

6. ANALYTICAL RESULTS

This section summarizes the analyses for the sampling activities. The sample results were compared against the EGLE Rule 57 Water Quality Values for non-drinking water. PFOS was the only perfluorinated compound detected above the EGLE Rule 57 Water Quality Value.

A Field Blank was collected during each sampling event as a quality control sample to verify whether cross-contamination occurred during sample collection, storage, and/or shipping to the laboratory. No PFAS were detected in the field blank samples, except for the field blank collected on January 4, 2023, which had low level detections all below criteria. The results for the blind field duplicate samples were consistent with the results of the associated original samples.

6.1 Sanitary Sewer Sample Results

A total of thirty-one sanitary sewer samples (including 3 duplicates) were collected from thirteen locations prior to completion of the liner activities between November 2019 and June 2021. The samples were analyzed for PFAS by method ASTMD7979-19 (no preservative). The analytical results are presented in **Table 2**, **Figure 2**, and **Appendix D** (Analytical Laboratory Reports).

PFOS was detected above the EGLE Rule 57 Water Quality value of 12 ng/l at eleven of the thirteen sample locations. The maximum concentration exceeding the criteria for PFOS was detected at a concentration of 230 ng/l in sample SAN-3 collected on June 25, 2020. PFOS was not detected above the reporting limit at the samples collected from SAN-07 and SAN-17 on March 18, 2020 and March 19, 2020.

Following the lining activities there has been a decrease in PFOS concentrations seen in the three locations (SAN-06, SAN-12, & SAN-14) that continue to be sampled. The analytical results from the last sampling event in December 2022 show PFOS was below criteria at SAN-06 (4.5 ng/l), which is downstream from the work completed on Dunkirk Avenue, and SAN-14 (6.3 ng/l), which is downstream from the work completed on Morris Hills Parkway. PFOS was detected at a concentration of 18 ng/l, which is a decrease from the March 31, 2022 result of 120 ng/l for PFOS from SAN-12, which is downstream from Hartman Street and Temple Avenue.

6.2 Storm Water Sewer Sample Results

Five storm water samples were collected from MH-18 prior to completion of the liner activities between November 2019 and June 2021, and four samples were collected from SS-06 (including one duplicate) between August 2020 and June 2021. The samples were analyzed for PFAS by method ASTMD7979-19 (no preservative). The analytical results are presented in **Table 3**, **Figure 3**, and **Appendix D** (Analytical Laboratory Reports).

As indicated in **Table 3** and **Figure 3**, PFOS analytical results in storm water from MH-18 ranged from 210 ng/l to 460 ng/l. The PFOS analytical results in storm water from SS-06 ranged from 3.6 ng/l to 180 ng/l for PFOS prior to the sewer lining and manhole sealing.

No flowing water has been observed within manhole MH-18 from the storm sewer line since the lining and manhole (MH-18A & MH-18B) sealing were completed.

The PFOS concentration from SS-10 following the lining activities was 17 ng/l on September 7, 2022, and PFOS was not detected above the reporting limit in the sample collected on January 4, 2023.

6.3 Excavated Material

The excavated material (from the spot repair of the sewer main on Temple Avenue and stockpiled on-Site) was sampled on December 1, 2021 for the following constituents: PFAS, Michigan 10 Metals, and Volatile Organic Compounds (VOCs). PFAS, cadmium, selenium, silver, and VOCs were not detected in the sample. See **Appendix D** (Analytical Laboratory Reports). A summary of the detected constituents are provided below:

- Arsenic concentration was detected at a concentration of 1,080 µg/kg, which is below the statewide default background levels.
- Barium concentration was detected at a concentration of 38,500 µg/kg, which is below the statewide default background levels.
- Chromium concentration was detected at a concentration of 3,700 µg/kg, which is below the statewide default background levels.
- Copper concentration was detected at a concentration of 4,200 µg/kg, which is below the statewide default background levels.
- Lead concentration was detected at a concentration of 6,530 µg/kg, which is below the statewide default background levels.
- Zinc concentration was detected at a concentration of 22,100 µg/kg, which is below the statewide default background levels.
- Mercury concentration was detected at a concentration of 67 µg/kg, which is below the statewide default background levels.

Therefore, the spot (point) repair material satisfies the cleanup criteria for unrestricted residential use.

7. CONCLUSION/ NEXT STEPS

Based on the analytical results and reduced flow within the sewers it appears that the repairs/rehabilitation of sewers and manholes west of the Site has successfully reduced the quantity of groundwater infiltrating the sewer system resulting in a significant improvement in the quality of the sewer results and decrease in PFOS mass (i.e., a significant reduction in the concentrations detected in the sewers).

Lateral R-11, which is associated with a house with the address of 1160 Dunkirk Avenue and was missed during the lining activities will be repaired. Scheduling of lining this lateral is in progress.

Ramboll on behalf of RACER Trust, will continue monitor the sanitary and storm sewer systems west of the Site to determine the effectiveness of the repairs/rehabilitation to lower the PFOS concentration at downstream locations and to determine if additional monitoring and/or repair work may be needed. This will be done by collecting quarterly samples from the sanitary sewer at locations SAN-06, SAN-12, and SAN-14, and from the storm sewer at locations SS-10 and MH-18 (if flow is observed) through the end of 2023 at which time the frequency will be reevaluated and a proposal for further monitoring will be provided to EGLE for review.

TABLES

TABLE
RACER Trust - Coldwater Road
Sanitary Sewer Lateral Lining Detail - West of Site

LFS ID	House Number	Street Name	Manhole Location	Upstream	Downstream	Main Diameter	Lateral Diameter	Recommended Install Length	Lateral Length/ Installed	Distance From US M/H	Date Cleaned	Point Repair Required	Lining Date	Comments
Manhole 1 to 2														
6		Morris Hills	Street	1	2	8	6			313'/DSMH				Capped AT MAIN.
6	1203	Morris Hills	Street	1	2	8	6	21	19	303'/DSMH	10/6/2021		12/1/2021	6" TEE AT 11:00, CALICUM IN SM OFFSET THAT WON'T COME OUT AT 22.2'. FINISHED AT 30'. MAYBE SHORTER LINER TO 21.5'?
6	1198A	Morris Hills	Street	1	2	8	6	17	25	298'/DSMH	10/6/2021		12/1/2021	6" TEE AT 12:00. FINISHED AT 22.2'. FULL OF MUD, LOOKS DEAD
6	1198	Morris Hills	Street	1	2	8	6	25	25	276'/DSMH	10/6/2021		12/1/2021	6" TEE AT 1:00. FINISHED AT 30', END OF LINER TO 25'.
6	1197	Morris Hills	Street	1	2	8	6	25	25	249'/DSMH	10/6/2021		12/2/2021	6" TEE AT 11:00. 45 TURN AT 1'. FINISHED AT 30', END OF LINER TO 25'.
6	1194	Morris Hills	Street	1	2	8	6	25	25	229'/DSMH	10/6/2021		12/2/2021	6" TEE AT 1:00. FINISHED AT 30', END OF LINER TO 25'.
6	1190	Morris Hills	Street	1	2	8	6	25	25	197'/DSMH	10/6/2021		12/7/2021	6" TEE AT 1:00. FINISHED AT 30', END OF LINER TO 25'.
		Morris Hills	Street	1	2	8	6			193'/DSMH				Capped AT MAIN
	1193	Morris Hills	Street	1	2	8	4			192'/DSMH	10/6/2021			4" CAST IRON TEE AT 12:00, CAN'T GET IN DUE TO TURN IN PIPE AT 0.3'. LIVE LATERAL
		Morris Hills	Street	1	2	8	6			172'/DSMH				Capped AT MAIN
	1189A	Morris Hills	Street	1	2	8	6			165'/DSMH	10/6/2021			6" TEE AT 10:00,MUD MOST OF THE WAY. LOOKS DEAD
	1189	Morris Hills	Street	1	2	8	4			154'/DSMH	10/6/2021			4" CAST IRON TEE AT 12:00, CAN'T GET IN DUE TO TURN IN PIPE AT 0.3'. LIVE LATERAL
6	1186	Morris Hills	Street	1	2	8	6	25	25	145'/DSMH	10/6/2021		12/7/2021	6" TEE AT 1:00, FINISHED AT BROKEN CLAY AT 27.2'. END OF LINER TO 24'.
		Morris Hills	Street	1	2	8	6			116'/DSMH				Capped AT MAIN
6	1182	Morris Hills	Street	1	2	8	6	25	25	111'/DSMH	10/6/2021		12/7/2021	6" TEE AT 1:00. FINISHED AT 30', END OF LINER TO 25'. CONDEMNED
	1185	Morris Hills	Street	1	2	8	4			100'/DSMH	10/6/2021			4" CAST IRON TEE AT 12:00, CAN'T GET IN DUE TO TURN IN PIPE AT 0.3'. LIVE LATERAL
6	1180	Morris Hills	Street	1	2	8	6	21	21	63'/DSMH	10/6/2021		12/7/2021	6" TEE AT 3:00, FINISHED AT 30'. END OF LINER TO 24'. COULD NOT GET LARGE PIECE OF CALCIUM OUT AT 25'. . CONDEMNED
	1181	Morris Hills	Street	1	2	8	4			58'/DSMH	10/6/2021			4" CAST IRON TEE AT 10:00, CAN'T GET IN DUE TO OFFSET AT MMC TO CAST IRON AT 0.3'. LIVE LATERAL
	EMPTY LOT	Morris Hills	Street	1	2	8	6			46'/DSMH	10/6/2021			6" BREAKIN TEE AT 11:00, FINISHED AT MUD AT 28'. EMPTY LOT, NO HOUSE. LOOKS DEAD.
		Morris Hills	Street	1	2	8	6			32'/DSMH				Capped AT MAIN
Manhole 4 to 5														
	CAPPED B	Temple	Street	4	5	8	6			5/USMH	10/4/2021	Spot Liner Installed	1/5/2022	Capped AT 4'
	CAPPED A	Temple	Street	4	5	8	6			8/USMH	10/4/2021	Spot Liner Installed	1/5/2022	Capped AT 5'
5	1208	Temple	Street	4	5	8	6	18		18/USMH	10/14/2021		2/1/2022	6" TEE AT 12:00. 90 TURN WITH JOM AT 4.3'. FINSHED AT LARGE PIECE OF CONC COMING IN FROM A HOLE AT THE TOP OF THE PIPE AT 21'. NO WAY TO GET IT OUT. END OF LINER
5	1208/1207	Temple	Street	4	5	8	6	2		28/USMH	10/14/2021		1/5/2022	6" WYE AT 11.00, FINISHED AT 90 TURN AND SIDE SERVICE AT 4.8'. LOOKS TO BE GOING TO 1207. END OF LINER TO 2'.
	CAPPED	Temple	Street	4	5	8	6			75/USMH	10/4/2021	Spot Liner Installed	1/5/2022	Capped AT 3'
	EMPTY LOT D	Temple	Street	4	5	8	6			92/USMH	10/4/2021			6" BREAKIN TEE AT 12:00, FINISHED AT ROOTBALL AT 28.5'. EMPTY LOT, NO HOUSE. LOOKS DEAD
		Temple	Street	4	5	8	6			135/USMH				Capped AT MAIN
5	1189	Temple	Street	4	5	8	6	17		172/USMH	10/4/2021		1/10/2022	WYE AT 1:00, 90 TURN AT 4.5'. FINISHED AT 17'. CAN'T PUCH ANY FURTHER DUE TO 90 TUR
	EMPTY LOT C	Temple	Street	4	5	8	6			176/USMH	10/1/2021			6" BREAKIN TEE AT 12:00, FINISHED AT 16.6'. FULL OF MUD. LOOKS DEAD
	EMPTY LOT B	Temple	Street	4	5	8	6			213/USMH	10/1/2021			6" BREAKIN TEE AT 11:00, FINISHED AT 11.8'. FULL OF MUD. LOOKS DEAD
		Temple	Street	4	5	8	6			240/USMH				Capped AT MAIN
5	1180	Temple	Street	4	5	8	4	25		280/USMH, 41'/DSMH	10/14/2021		2/1/2022	VIDEOED FROM DSMH, 4" CAST IRON TEE AT 2:00, CLOTH HANGING AT MOUTH THAT JETTER WON'T GET OUT. SHOULDN'T BE A PROBLEN TO LINE THROUGH. FINISEHD AT 30'.
		Temple	Street	4	5	8	6			280.5/USMH				Capped AT MAIN
	EMPTY LOT A	Temple	Street	4	5	8	6	5		298/USMH	10/1/2021		2/1/2022	6" BREAKIN TEE AT 3:00, FINISHED AT 4'. FULL OF MUD. LOOKS DEAD
	1176	Temple	Street	4	5	8	4			310/USMH, 8'/ DSMH	10/14/2021			VIDEOED FROM DSMH, 4" CAST IRON TEE AT 2:00, COULD NOT LAUNCH DUE TO OFFSET AT MOUTH.
	BROKEN CAP	Temple	Street	4	5	8	6			312/USMH, 7'/DSMH	10/14/2021			VIDEOED FROM DSMH. 6" WYE AT 11:00, DEAD LATERAL. LOOKS LIKE A BROKE CAP. WALL OF MUD
	EMPTY LOT	Temple	Street	4	5	8	6			316/USMH	10/1/2021			6" BREAKIN TEE AT 2:00. FINISHED AT 1.6'. LINE IS FULL OF MUD. LOOKS DEAD

Notes:
Light blue highlight indicates line was capped.
Yellow highlight indicates lateral is not lined.

TABLE 1
RACER Trust - Coldwater Road
Sanitary Sewer Lateral Lining Detail - West of Site

LFS ID	House Number	Street Name	Manhole Location	Upstream	Downstream	Main Diameter	Lateral Diameter	Recommended Install Length	Lateral Length/ Installed	Distance From US M/H	Date Cleaned	Point Repair Required	Lining Date	Comments
Manhole 7 to 8														
4	1200	Hartman	Street	7	8	8	6	25	3	7'/USMH	9/30/2021		1/31/2022	6" BROKEN WYE AT 10:00, 22.5 TURN AT 4.2'. FINISHED AT 30.5' AT ROOT BLOCKAGE. END OF LINER TO 25'.
4	1201	Hartman	Street	7	8	8	6	25	25	10'/USMH	9/30/2021		12/28/2021	6" WYE AT 11:00, BROKEN AT 4.2'. FINISHED AT 30'. END OF LINER TO 25'.
4	1196	Hartman	Street	7	8	8	6	19	19	40'/USMH	9/30/2021		12/28/2021	CALCIUM IN A GOUPLE SPOTS THAT I COULDN'T GET OUT. SHOULDN'T BE A PROBLEM. WORKED ON THIS LATERAL JUST ABOUT ALL DAY.
		Hartman	Street	7	8	8	6			57'/USMH				Capped AT MAIN
4	1193	Hartman	Street	7	8	8	6	1	1	62'/USMH	9/30/2021		12/29/2021	6" BREAKIN TEE AT 1:00, FINISHED AT 1.6' AT HARD 90 TURN WITH OFFSET. CAN'T GET PASSED IT.
		Hartman	Street	7	8	8	6			94'/USMH				Capped AT MAIN
4	1192/1188	Hartman	Street	7	8	8	6	1.5	1.5	114'/USMH	9/30/2021		12/29/2021	6" PROTUDING TEE AT 11:00, SIDE SERVICE COMING IN AT 2.3' GOING TO HOUSE 1188, FINISHED AT 30'. END OF LINER TO 1.5'?
		Hartman	Street	7	8	8	6			140'/USMH				Capped AT MAIN
4	1185	Hartman	Street	7	8	8	6	25	25	147'/USMH	9/30/2021		12/29/2021	6" PROTRUDING TEE AT 2:00, FINISHED AT 30'. END OF LINER TO 25'.
		Hartman	Street	7	8	8	6			242'/USMH				Capped AT MAIN
4	1177	Hartman	Street	7	8	8	6	25	25	244'/USMH	9/30/2021		12/29/2021	6" TEE AT 12:00, 90 TURN AT 2'. FINISHED AT 30'. END OF LINER TO 25'.
4	1170	Hartman	Street	7	8	8	6	25	25	304'/USMH	9/30/2021		12/30/2021	6" PROTRUDING TEE AT 9:00, FINISHED AT 30'. END OF LINER TO 25'.
Manhole 11 to 12														
		Dunkirk	Street	11	12	8	6			161'/DSMH				Capped AT MAIN
1	1204	Dunkirk	Street	11	12	8	6	25	25	143'/DSMH	10/13/2021		12/16/2021	6" TEE AT 1:00, 45 TURN AT 2.3'. FINISHED AT 30', END OF LINER TO 25'.
	1194	Dunkirk	Street	11	12	8	4			89'/DSMH	10/13/2021			4" CAST IRON TEE AT 1:00. CAN NOT LAUNCH DUE TO OFFSET.
	1190	Dunkirk	Street	11	12	8	4			52'/DSMH	10/7/2021			4" CAST IRON TEE AT 1:00, OFFSET AT MOUTH. CAN'T GET INTO LATERAL.
1	1187	Dunkirk	Street	11	12	8	4	25		16'/DSMH	10/13/2021		Non-Perform	4" CAST IRON TEE AT 10:00, FINISHED AT 30'. END OF LINER TO 25'. CLEANED MULTIBLE TIMES.
Manhole 12 to 13														
	1183	Dunkirk	Street	12	13	8	4			22'/USMH	10/7/2021			4" CAST IRON TEE AT 1:00, OFFSET AT MOUTH. CAN'T GET INTO LATERAL.
2	1180	Dunkirk	Street	12	13	8	6	25	25	45'/USMH	10/13/2021		12/15/2021	6" TEE AT 11:00, FIINSHED AT 30'. END OF LINER TO 25'.
2	1183A	Dunkirk	Street	12	13	8	6	1	1	79'/USMH	10/13/2021		12/15/2021	6" PRUTRUDING TEE AT 3:00, FINISHED AT 4" TRANSITION AT 3.3'. END OF LINER TO 1'
2	1171	Dunkirk	Street	12	13	8	6	24	24	85'/USMH	10/13/2021		12/4/2021	6" TEE AT 1:00, 6" TEE AT 1:00, FINISHED AT BLOCKAGE AT 28' THAT I CAN'T GET OUT. END OF LINER TO 24'.
2	1174	Dunkirk	Street	12	13	8	6	25	25	103'/USMH	10/13/2021		12/14/2021	6" TEE AT 11:00, FINISHED AT 30'. END OF LINER TO 25'.
	1165	Dunkirk	Street	12	13	8	4			179'/USMH	10/13/2021			4" CAST IRON TEE AT 2:00, OFFSET AT MOUTH. CAN'T GET INTO LATERAL.
2	1166	Dunkirk	Street	12	13	8	6	25	25	216'/USMH	10/13/2021		12/14/2021	6" TEE AT 10:00, FINISHED AT 30'. END OF LINER TO 25'.
	EMPTY FIELD	Dunkirk	Street	12	13	8	6			105'/DSMH	10/7/2021	Spot Liner Installed	2/16/2022	6" TEE AT 11:00, FINISHED AT 3.3'. LINE FULL OF DEBRIS. EMPTY FIELD. LINE IS DEAD.
	EMPTY LOT	Dunkirk	Street	12	13	8	6			69'/DSMH	10/7/2021	Spot Liner Installed	2/16/2022	6" TEE AT 2:00, FINISHED AT 26'. LINE IS DEAD GOING TO EMPTY LOT.
2	1158	Dunkirk	Street	12	13	8	6	25	25	30'/DSMH	10/13/2021		12/15/2021	6" TEE AT 3:00, CALCUIM IN JOINT AT 7' THAT WOULD NOT COME OUT. FINISHED AT 30'. END OF LINER TO 25'.
Manhole 13 to 14														
3	1133	Dunkirk	Street	13	14	8	6	25	25	92'/USMH	10/13/2021		12/22/2021	6" TEE AT 3:00, FINISHED AT 30'. END OF LINER TO 25'.
		Dunkirk	Street	13	14	8	6			121'/USMH				CAPPED AT MAIN
3	1134	Dunkirk	Street	13	14	8	6	25	25	124'/USMH	10/13/2021		12/22/2021	6" TEE AT 9:00, FINISHED AT 30'. END OF LINER TO 25'.
3	1127	Dunkirk	Street	13	14	8	6	15.5	25	164'/USMH	10/13/2021		12/21/2021	6" WYE AT 3:00, 90 TURN AT 2.5'. BAD CALICUM AT 17' THAT WOULD NOT COME OUT. PIPE STARTING TO BREAK. FINISHED AT 30'. END OF LINER TO 15.5'?
		Dunkirk	Street	13	14	8	6			166'/USMH				CAPPED AT MAIN
3	1130	Dunkirk	Street	13	14	8	6	21	21	177'/USMH	10/13/2021		12/21/2021	6" TEE AT 10:00, CLOTH IN JOINTS AT 21' AND 25'. WON'T COME OUT WITH JETTER. LINE TO 21'?
3	1119	Dunkirk	Street	13	14	8	4	25		223'/USMH	10/13/2021		Non-Perform	4" CAST IRON TEE AT 3:00, MMC TO PVC AT 15.5'. FINISHED AT 30'. END OF LINER TO 25'. JETTED MULTIBLE TIMES.
	1109	Dunkirk	Street	13	14	8	4			296'/USMH	10/13/2021			4" CAST IRON TEE AT 3:00, OFFSET AT TRANSITION TO CAST IRON AT MOUTH. CAN'T LAUNCH.
3	1110	Dunkirk	Street	13	14	8	6	25	25	306'/USMH	10/13/2021		12/21/2021	6" TEE AT 9:00, LATERAL OPENING IS TIGHT DUE TO CONC. BELLY FOR MOST OF THE WAY. FINISHED AT 30'. END OF LINER TO 25'.

Notes:
Light blue highlight indicates line was capped.
Yellow highlight indicates lateral is not lined.

TABLE 2
RACER Trust - Coldwater Road
Per-and Polyfluoroalkyl Substances Sampling Results
Sanitary Sewer Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID: / Sample Date:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	SAN-3 (Sanitary Sewer) Pre Lining 11/5/2019	SAN-3 (Sanitary Sewer) Pre Lining 6/25/2020	SAN-3 (Sanitary Sewer) Pre Lining 12/18/2020	SAN-3 (Sanitary Sewer) Pre Lining 3/11/2021	SAN-4 (Sanitary Sewer) Pre Lining 11/5/2019	SAN-5 (Sanitary Sewer) Pre Lining 11/5/2019	SAN-06 (Sanitary Sewer) Pre Lining 3/17/2020	SAN-06 (Sanitary Sewer) Pre Lining 6/25/2020
Perfluorobutanoic Acid (PFBA)		--	<19	25 U	<9.8	<10	<20	<20	<21	13 U
Perfluoropentanoic Acid (PFPeA)		--	<9.7	**5.0**	**1.2 J**	**1.8 J**	<10	<10	<10	**1.3 J**
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0 I
Perfluorohexanoic Acid (PFHxA)		--	<9.7	**5.4**	**1.6 J**	**1.8 J**	<10	<10	<10	<2.0
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	<9.7	**9.3**	**8.6**	**8.3**	<10	<10	<10	**3.1**
Perfluoroheptanoic Acid (PFHpA)		--	<9.7	**3.1**	<2.0	<2.0	<10	<10	<10	<2.0
Perfluoropentane Sulfonic Acid (PFPeS)		--	<9.7	**11**	**10**	**9.4**	<10	<10	<10	<2.0
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0 I
Perfluorooctanoic Acid (**PFOA**)		**170**	<9.7	**9.8**	**3.3**	**3.5**	<10	<10	<10	<2.0
Perfluorohexane Sulfonic Acid (PFHxS)		--	**40**	**63**	**52**	**42**	<10	**20**	<10	**11**
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**33**	**55**	**46**	**35**	<10	**16**	<10	**9.0**
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<9.7	**7.9**	**6.5**	**6.5**	<10	<10	<10	<2.0
Perfluorononanoic Acid (PFNA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<9.7	**9.9**	**9.4**	**4.4**	<10	<10	<10	<2.0
Perfluorodecanoic Acid (PFDA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<9.7	<4.1	<3.9	<4.1	<10	<10	<10	<3.9 I
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**110**	**230**	**210**	**96**	**61**	**170**	**14**	**21**
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**21**	**55**	**38**	**17**	**17**	**69**	<10	**5.7**
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**85**	**170**	**170**	**79**	**33**	**100**	<10	**16**
Perfluoroundecanoic Acid (PFUnDA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Perfluorononane Sulfonic Acid (PFNS)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Perfluorododecanoic Acid (PFDoDA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0 I
Perfluorodecane Sulfonic Acid (PFDS)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Perfluorotridecanoic Acid (PFTrDA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0 I
Perfluorooctane Sulfonamide (FOSA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Perfluorotetradecanoic Acid (PFTeDA)		--	<9.7	<4.1	<3.9	<4.1	<10	<10	<10	<3.9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<9.7	<2.0	<2.0	<2.0	<10	<10	<10	<2.0
Total Per-and Polyfluoroalkyl Substances		--	**150.0**	**371.5**	**296.1**	**167.2**	**61.0**	**190.0**	**14.0**	**49.4**

Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) I - Matrix interference with internal standard.
9) J - Estimated value less than reporting limit, but greater than MDL.
10) Light gray header are post lining sampling event result.
11) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.

TABLE 2
RACER Trust - Coldwater Road
Per-and Polyfluoroalkyl Substances Sampling Results
Sanitary Sewer Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID: / Sample Date:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	SAN-06 (Sanitary Sewer) Pre Lining 12/18/2020	SAN-06 (Sanitary Sewer) Pre Lining 3/11/2021	SAN-06 (Sanitary Sewer) Post Lining 3/31/2022	SAN-06 (Sanitary Sewer) Post Lining 9/7/2022	SAN-06 (Sanitary Sewer) Post Lining 12/13/2022	SAN-07 (Sanitary Sewer) Pre Lining 3/18/2020	SAN-10 (Sanitary Sewer) Pre Lining 3/18/2020	SAN-10 (Sanitary Sewer) Pre Lining 6/25/2020
Perfluorobutanoic Acid (PFBA)		--	<10	<11	<10	<10	<9.6	<21	<20	10 U
Perfluoropentanoic Acid (PFPeA)		--	<4.0	**1.9 J**	**3.2 J**	<4.0	<3.8	<11	<10	<3.9
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<2.0 I	<2.1	<2.1	<2.0 I	<1.9	<11	<10	<2.0 **I**
Perfluorohexanoic Acid (PFHxA)		--	<2.0	**1.9 J**	**3.1**	**3.4**	**2.1**	<11	<10	<2.0
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	**3.7**	**4.5**	**11**	<2.0	<1.9	<11	<10	**5.2**
Perfluoroheptanoic Acid (PFHpA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
Perfluoropentane Sulfonic Acid (PFPeS)		--	<2.0	**2.3**	**6.7**	<2.0	<1.9	<11	<10	<2.0
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<2.0 I	<2.1	<2.1	<2.0 I	<1.9	<11	<10	<2.0 **I**
Perfluorooctanoic Acid (**PFOA**)		**170**	<2.0	<2.1	**2.7**	<2.0	<1.9	<11	<10	<2.0
Perfluorohexane Sulfonic Acid (PFHxS)		--	**6.3**	**10**	**18**	**5.6**	<1.9	<11	<10	**9.5**
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**5.0**	**8.1**	**14**	**2.5**	<1.9	<11	<10	**7.7**
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<2.0	<2.1	**3.7**	**2.7**	<1.9	<11	<10	<2.0
Perfluorononanoic Acid (PFNA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<2.0 I	<2.1	<2.1	<2.0 I	<1.9	<11	<10	<2.0 **I**
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
Perfluorodecanoic Acid (PFDA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0 **I**
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<4.0 I	<4.2	<4.1	<4.0	<3.8	<11	<10	<3.9 **I**
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**26**	**34**	**38**	**13**	**4.5**	<11	**29**	**26**
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**5.0**	**5.7**	**5.7**	**3.6**	**2.0**	<11	<10	**6.2**
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**19**	**27**	**31**	**9.1**	**2.4**	<11	**24**	**19**
Perfluoroundecanoic Acid (PFUnDA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
Perfluorononane Sulfonic Acid (PFNS)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
Perfluorododecanoic Acid (PFDoDA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0 **I**
Perfluorodecane Sulfonic Acid (PFDS)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
Perfluorotridecanoic Acid (PFTrDA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0 **I**
Perfluorooctane Sulfonamide (FOSA)		--	<2.0 I	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0 **I**
Perfluorotetradecanoic Acid (PFTeDA)		--	<4.0	<4.2	<4.1	<4.0	<3.8	<11	<10	<3.9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<2.0	<2.1	<2.1	<2.0	<1.9	<11	<10	<2.0
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<2.0	<2.1	<4.1	<10	<9.6	<11	<10	<2.0
Total Per-and Polyfluoroalkyl Substances		--	**36.0**	**54.6**	**82.7**	**22.0**	**6.6**	**0.0**	**29.0**	**50.7**

Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) I - Matrix interference with internal standard.
9) J - Estimated value less than reporting limit, but greater than MDL.
10) Light gray header are post lining sampling event result.
11) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.

TABLE 2
RACER Trust - Coldwater Road
Per-and Polyfluoroalkyl Substances Sampling Results
Sanitary Sewer Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID: / Sample Date:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	SAN-10 (Sanitary Sewer) Pre Lining 12/18/2020	SAN-DUP-121820 (SAN-10) Sanitary Sewer Pre Lining 12/18/2020	SAN-10 (Sanitary Sewer) Pre Lining 3/11/2021	SAN-DUP-031121 (SAN-10) Sanitary Sewer Pre Lining 3/11/2021	SAN-11 (Sanitary Sewer) Pre Lining *3/18/2020*	SAN-12 (Sanitary Sewer) Pre Lining *3/18/2020*	SAN-12 (Sanitary Sewer) Pre Lining *6/25/2020*	SAN-12 (Sanitary Sewer) Pre Lining *12/18/2020*
Perfluorobutanoic Acid (PFBA)		--	<9.9	<10	<11	<10	<19	<20	15 U	<9.8
Perfluoropentanoic Acid (PFPeA)		--	<4.0	<4.1	**2.2 J**	**1.8 J**	<9.7	<10	<4.1	<3.9
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<2.0 **I**	<2.0 **I**	<2.1	<2.0	<9.7	<10	<2.0 **I**	<2.0
Perfluorohexanoic Acid (PFHxA)		--	<2.0	<2.0	**1.6 J**	**1.7 J**	<9.7	<10	<2.0	<2.0
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	**5.0**	**4.0**	**6.2**	**6.9**	**9.9**	<10	<2.0	**2.3**
Perfluoroheptanoic Acid (PFHpA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluoropentane Sulfonic Acid (PFPeS)		--	**2.2**	**2.1**	**4.1**	**5.0**	<9.7	<10	<2.0	<2.0
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0 **I**	<2.0
Perfluorooctanoic Acid (**PFOA**)		**170**	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluorohexane Sulfonic Acid (PFHxS)		--	**9.4**	**9.1**	**13**	**15**	**25**	**16**	**2.1**	**3.8**
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**7.7**	**7.2**	**11**	**11**	**21**	**12**	<2.0	**2.8**
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<2.0	<2.0	**2.4**	**3.2**	<9.7	<10	<2.0	<2.0
Perfluorononanoic Acid (PFNA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<2.0 **I**	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<2.0	<2.0	<2.1	**2.3**	<9.7	<10	<2.0	<2.0
Perfluorodecanoic Acid (PFDA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<4.0 **I**	<4.0 **I**	<4.3	<4.1	<9.7	<10	<4.1 **I**	<3.9
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**31**	**33**	**43**	**45**	**160**	**110**	**55**	**55**
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**4.7**	**4.9**	**7.2**	**8.2**	**62**	**48**	**32**	**33**
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**25**	**26**	**34**	**36**	**100**	**66**	**21**	**21**
Perfluoroundecanoic Acid (PFUnDA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluorononane Sulfonic Acid (PFNS)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluorododecanoic Acid (PFDoDA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0 **I**	<2.0
Perfluorodecane Sulfonic Acid (PFDS)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluorotridecanoic Acid (PFTrDA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0 **I**	<2.0
Perfluorooctane Sulfonamide (FOSA)		--	<2.0 **I**	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Perfluorotetradecanoic Acid (PFTeDA)		--	<4.0	<4.1	<4.3	<4.1	<9.7	<10	<4.1	<3.9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<2.0	<2.0	<2.1	<2.0	<9.7	<10	<2.0	<2.0
Total Per-and Polyfluoroalkyl Substances		--	**47.6**	**48.2**	**70.1**	**77.7**	**194.9**	**126.0**	**72.1**	**61.1**

Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) I - Matrix interference with internal standard.
9) J - Estimated value less than reporting limit, but greater than MDL.
10) Light gray header are post lining sampling event result.
11) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.

TABLE 2
RACER Trust - Coldwater Road
Per-and Polyfluoroalkyl Substances Sampling Results
Sanitary Sewer Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID: / Sample Date:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	SAN-12 (Sanitary Sewer) Pre Lining 3/11/2021	SAN-12 (Sanitary Sewer) Post Lining 3/31/2022	SAN-12 (Sanitary Sewer) Post Lining 9/7/2022	SAN-12 (Sanitary Sewer) Post Lining 12/13/2022	SAN-13 (Sanitary Sewer) Pre Lining 3/19/2020	SAN-14 (Sanitary Sewer) Pre Lining 3/19/2020	SAN-14 (Sanitary Sewer) Pre Lining 6/25/2020	SAN-14 (Sanitary Sewer) Pre Lining 12/18/2020
Perfluorobutanoic Acid (PFBA)		--	<10	<10	<10	<9.8	<100	<100	12 U	<10.0
Perfluoropentanoic Acid (PFPeA)		--	**7.3**	**7.1**	<4.1	**14**	<10	<10	**2.1 J**	**3.6 J**
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0 **I**
Perfluorohexanoic Acid (PFHxA)		--	**5.6**	**6.0**	**1.6 J**	**12**	<10	<10	**1.8 J**	**3.8**
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	**5.6**	**8.4**	<2.0	**2.0**	<10	<10	**2.5**	**11**
Perfluoroheptanoic Acid (PFHpA)		--	**1.9 J**	**2.0 J**	<2.0	<2.0	<10	<10	**1.6 J**	**2.8**
Perfluoropentane Sulfonic Acid (PFPeS)		--	<2.0	**5.0**	<2.0	<2.0	<10	<10	<2.0	<2.0
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0 **I**
Perfluorooctanoic Acid (**PFOA**)		**170**	**5.0**	**7.0**	<2.0	**2.6**	<10	<10	**4.4**	**9.4**
Perfluorohexane Sulfonic Acid (PFHxS)		--	**5.6**	**22**	<2.0	**2.3**	**19**	<10	**2.9**	**6.2**
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**3.6**	**18**	<2.0	**1.7 J**	**16**	<10	**2.0**	**4.3**
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<2.0	**3.5**	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorononanoic Acid (PFNA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<2.0	<2.1	<2.0 **I**	<2.0	<10	<10	<2.0	<2.0
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<2.0	**4.8**	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorodecanoic Acid (PFDA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<4.1	<4.1	<4.1	<3.9	<10	<10	<4.0	<4.0 **I**
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**48**	**120**	**19**	**18**	**150**	**29**	**23**	**52**
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**24**	**50**	**12**	**7.2**	**75**	<10	**9**	**21**
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**22**	**69**	**4.8**	**10**	**75**	**20**	**13**	**30**
Perfluoroundecanoic Acid (PFUnDA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorononane Sulfonic Acid (PFNS)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorododecanoic Acid (PFDoDA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorodecane Sulfonic Acid (PFDS)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorotridecanoic Acid (PFTrDA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorooctane Sulfonamide (FOSA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Perfluorotetradecanoic Acid (PFTeDA)		--	<4.1	<4.1	<4.1	<3.9	<10	<10	<4.0	<4.0
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<2.0	<2.1	<2.0	<2.0	<10	<10	<2.0	<2.0
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<2.0	<4.1	<10	<9.8	<10	<10	<2.0	<2.0
Total Per-and Polyfluoroalkyl Substances		--	**79.0**	**182.3**	**20.6**	**50.9**	**169.0**	**29.0**	**50.3**	**88.8**

Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) I - Matrix interference with internal standard.
9) J - Estimated value less than reporting limit, but greater than MDL.
10) Light gray header are post lining sampling event result.
11) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.

TABLE 2
RACER Trust - Coldwater Road
Per-and Polyfluoroalkyl Substances Sampling Results
Sanitary Sewer Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID: / Sample Date:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	SAN-14 (Sanitary Sewer) Pre Lining 3/11/2021	SAN-14 (Sanitary Sewer) Post Lining 3/31/2022	SAN-14 (Sanitary Sewer) Post Lining 9/7/2022	SAN-14 (Sanitary Sewer) Post Lining 12/13/2022	SAN-15 (Sanitary Sewer) Pre Lining 3/19/2020	SAN-16 (Sanitary Sewer) Pre Lining 3/19/2020	SAN-17 (Sanitary Sewer) Pre Lining 3/19/2020	SAN-DUP-1/ SAN-17 (Sanitary Sewer) Pre Lining 3/19/2020
Perfluorobutanoic Acid (PFBA)		--	<11	<11	<11	<9.9	<98	<100	<96	<99
Perfluoropentanoic Acid (PFPeA)		--	**11**	**3.2 J**	<4.3	<3.9	<9.8	<10	<9.6	<9.9
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorohexanoic Acid (PFHxA)		--	**8.0**	**2.8**	**2.5**	**1.5 J**	<9.8	<10	<9.6	<9.9
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	**10.0**	**7.6**	**2.5**	**3.0**	<9.8	**12**	<9.6	<9.9
Perfluoroheptanoic Acid (PFHpA)		--	**5.5**	**1.6 J**	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluoropentane Sulfonic Acid (PFPeS)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorooctanoic Acid (**PFOA**)		**170**	**12**	**4.7**	**3.2**	<2.0	<9.8	<10	<9.6	<9.9
Perfluorohexane Sulfonic Acid (PFHxS)		--	**4.6**	**3.0**	**3.3**	**4.0**	<9.8	<10	<9.6	<9.9
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**3.4**	**2.1**	**2.4**	**2.6**	<9.8	<10	<9.6	<9.9
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorononanoic Acid (PFNA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<2.1	<2.1	<2.1 **I**	<2.0	<9.8	<10	<9.6	<9.9
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorodecanoic Acid (PFDA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<4.2	<4.2	<4.3	<3.9	<9.8	<10	<9.6	<9.9
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**40**	**15**	**14**	**6.3**	**35**	**13**	<9.6	<9.9
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**17**	**3.7**	**6.6**	**2.4**	**12**	<10	<9.6	<9.9
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**23**	**11**	**8.1**	**3.8**	**20**	<10	<9.6	<9.9
Perfluoroundecanoic Acid (PFUnDA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorononane Sulfonic Acid (PFNS)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorododecanoic Acid (PFDoDA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorodecane Sulfonic Acid (PFDS)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorotridecanoic Acid (PFTrDA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorooctane Sulfonamide (FOSA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Perfluorotetradecanoic Acid (PFTeDA)		--	<4.2	<4.2	<4.3	<3.9	<9.8	<10	<9.6	<9.9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<2.1	<2.1	<2.1	<2.0	<9.8	<10	<9.6	<9.9
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<2.1	<4.2	<11	<9.9	<9.8	<10	<9.6	<9.9
Total Per-and Polyfluoroalkyl Substances		--	**91.1**	**37.9**	**25.5**	**14.8**	**35.0**	**25.0**	**0.0**	**0.0**

Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) I - Matrix interference with internal standard.
9) J - Estimated value less than reporting limit, but greater than MDL.
10) Light gray header are post lining sampling event result.
11) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.

TABLE 3
RACER Trust - Coldwater Road Peregrine Facilities
Per-and Polyfluoroalkyl Substances Sampling Results
Storm Water Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID: / Sample Date:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	SS-06 (Storm Sewer) Pre Lining 8/28/2020	SS-06 (Storm Sewer) Pre Lining 12/18/2020	SS-06 (Storm Sewer) Pre Lining 3/11/2021	SS-06 SS-DUP-031121 (Storm Sewer) Pre Lining 3/11/2021	SS-06 (Storm Sewer) Pre Lining 6/29/2021	SS-10 (Storm Sewer) Post Lining 9/7/2022	SS-10 (Storm Sewer) Post Lining 1/4/2023
Perfluorobutanoic Acid (PFBA)		--	<10	<9.9	<10	<11	<11	**11**	<9.7
Perfluoropentanoic Acid (PFPeA)		--	<4.1	**20**	**1.4 J**	**1.9 J**	**3.1 J**	**7.9**	<3.9
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorohexanoic Acid (PFHxA)		--	**1.8 J**	<2.0	<2.1	**1.5 J**	**3.2**	**7.2**	<1.9
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	**2.1**	**1.6 J**	**3.3**	**3.4**	**4.8**	**23**	<1.9
Perfluoroheptanoic Acid (PFHpA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	**5.1**	<1.9
Perfluoropentane Sulfonic Acid (PFPeS)		--	<2.0	<2.0	**3.2**	**2.2**	<2.1	<2.1	<1.9
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<2.0	<2.0	<2.1	<2.1	<4.2	<2.1	<1.9
Perfluorooctanoic Acid (**PFOA**)		**170**	**2.6**	<2.0	<2.1	<2.1	**2.0 J**	**9.7**	<1.9
Perfluorohexane Sulfonic Acid (PFHxS)		--	**3.4**	<2.0	**9.3**	**9.4**	**2.9**	**4.2**	<1.9
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**2.4**	<2.0	**7.3**	**7.3**	**2.1 J**	**3.0**	<1.9
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorononanoic Acid (PFNA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<2.0	<2.0	**2.2**	<2.1	<2.1	<2.1	<1.9
Perfluorodecanoic Acid (PFDA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<4.1	<3.9	<4.1	<4.2	<4.2	<2.1	<3.9
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**85**	**3.6**	**180**	**160**	**14**	**17**	<1.9
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**49**	<2.0	**88**	**81**	**5.7**	**3.8**	<1.9
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**37**	<2.0	**86**	**76**	**8.5**	**13**	<1.9
Perfluoroundecanoic Acid (PFUnDA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorononane Sulfonic Acid (PFNS)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorododecanoic Acid (PFDoDA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorodecane Sulfonic Acid (PFDS)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorotridecanoic Acid (PFTrDA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorooctane Sulfonamide (FOSA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Perfluorotetradecanoic Acid (PFTeDA)		--	<4.1	<3.9	<4.1	<4.2	<4.2	<4.1	<3.9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<2.0	<2.0	<2.1	<2.1	<2.1	<2.1	<1.9
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<2.0	<2.0	<2.1	<2.1	<11	<10	<9.7
Total Per-and Polyfluoroalkyl Substances		--	**94.9**	**25.2**	**199.4**	**178.4**	**30.0**	**85.1**	**0.0**

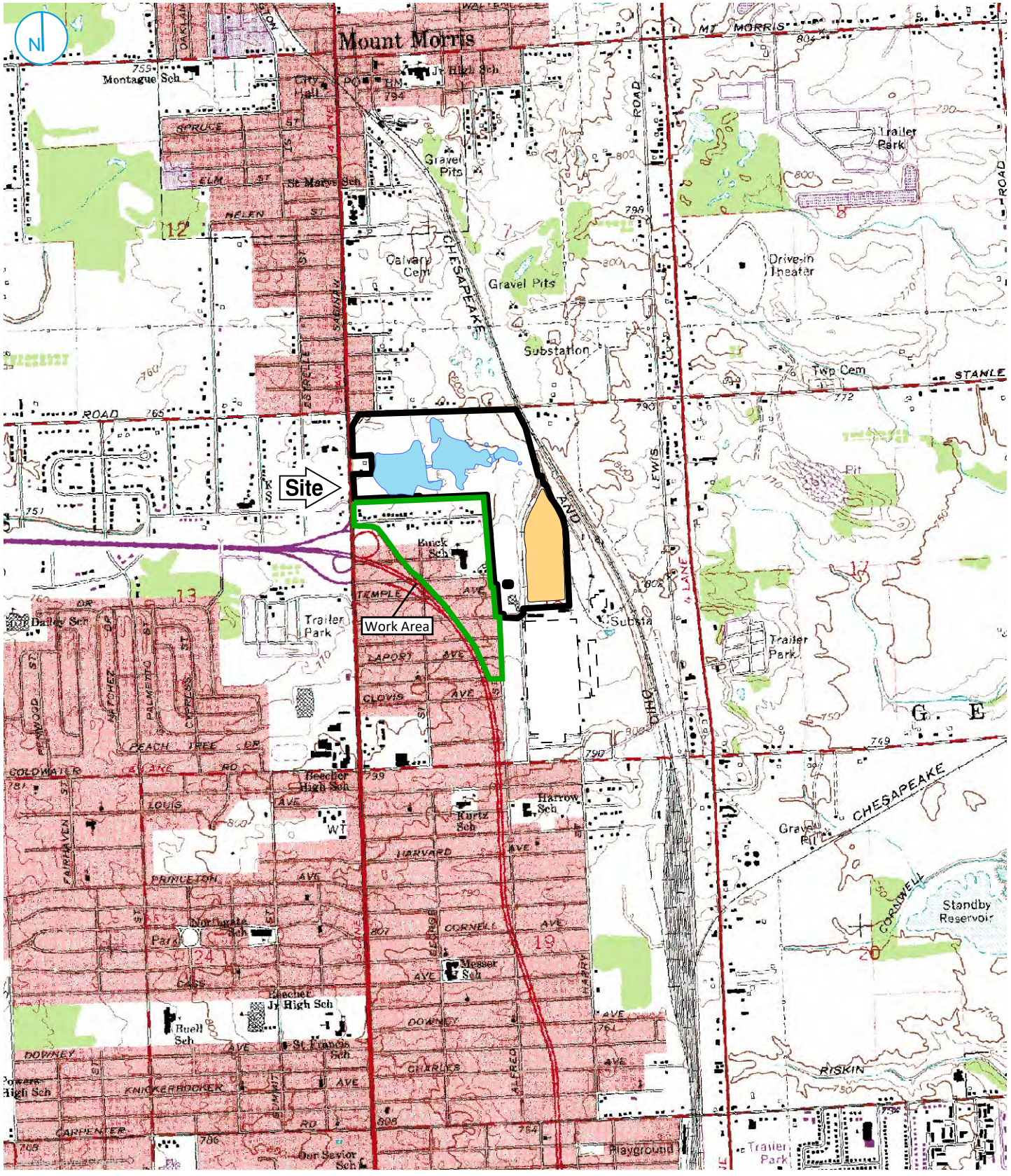
Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) J - Estimated value less than reporting limit, but greater than MDL.
9) Light gray header are post lining sampling event result.
10) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.
11) MH-18 storm sewer line has been dry since it was lined.
12) SS-10 is located in the manhole north of SS-06 along Saginaw Road and provides better access.

TABLE 3
RACER Trust - Coldwater Road Peregrine Facilities
Per-and Polyfluoroalkyl Substances Sampling Results
Storm Water Samples - Pre and Post Lining Results

Perfluorinated Compound	Well/Sample ID:	EGLE Part 201 Generic Groundwater Surface Water Interface Criteria / Rule 57 Surface Water Quality Values	MH-18 (Storm Sewer)	MH-18 (Storm Sewer)	MH-18 (Storm Sewer)	MH-18 (Storm Sewer)	MH-18 (Storm Sewer)	MH-18 (Storm Sewer)	MH-18 (Storm Sewer)	Field Blank-010423
			Pre Lining	Pre Lining	Pre Lining	Pre Lining	Pre Lining	Post Lining	Post Lining	Post Lining
	Sample Date:		*11/5/2019*	*8/3/2020*	*12/18/2020*	*3/11/2021*	*6/29/2021*	*9/7/2022*	*1/4/2023*	*1/4/2023*
Perfluorobutanoic Acid (PFBA)		--	<20	<10	<10	<9.9	**15**	DRY	DRY	<11
Perfluoropentanoic Acid (PFPeA)		--	<10	<4.0	<4.1	<3.9	**2.4 J**	DRY	DRY	<4.3
4:2 Fluorotelomer Sulfonic Acid (4:2 FTSA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
Perfluorohexanoic Acid (PFHxA)		--	<10	<2.0	<2.0	**1.9 J**	**2.7**	DRY	DRY	<2.1
Perfluorobutane Sulfonic Acid (PFBS)		**670,000**	<10	<2.0	**4.8**	**6.8**	**6.3**	DRY	DRY	<2.1
Perfluoroheptanoic Acid (PFHpA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	**1.6 J**
Perfluoropentane Sulfonic Acid (PFPeS)		--	<10	**2.2**	**8.1**	**14**	**13**	DRY	DRY	<2.1
6:2 Fluorotelomer Sulfonic Acid (6:2 FTSA)		--	<10	<2.0	<2.0	<2.0	<3.9	DRY	DRY	**30**
Perfluorooctanoic Acid (**PFOA**)		**170**	<10	<2.0	**1.8 J**	<2.0	**3.7**	DRY	DRY	**2.2**
Perfluorohexane Sulfonic Acid (PFHxS)		--	**15**	**8.6**	**33**	**40**	**30**	DRY	DRY	<2.1
Perfluorohexane Sulfonic Acid - LN (PFHxS-LN)		--	**12**	**7.4**	**28**	**31**	**24**	DRY	DRY	<2.1
Perfluorohexane Sulfonic Acid - BR (PFHxS-BR)		--	<10	<2.0	**4.3**	**7.9**	**5.3**	DRY	DRY	<2.1
Perfluorononanoic Acid (PFNA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	**2.0 J**
8:2 Fluorotelomer Sulfonic Acid (8:2 FTSA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	**32**
Perfluoroheptane Sulfonic Acid (PFHpS)		--	<10	**2.5**	**9.8**	**5.5**	**4.8**	DRY	DRY	<2.1
Perfluorodecanoic Acid (PFDA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
N-methyl Perfluorooctanesulfonamidoacetic Acid (N-MeFOSAA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
N-Ethyl Perfluorooctane Sulfonamidoacetic Acid (EtFOSAA)		--	<10	<4.0	<4.1	<3.9	<3.9	DRY	DRY	<2.1
Perfluorooctane Sulfonic Acid (**PFOS**)		**12**	**210**	**240**	**460**	**280**	**310**	DRY	DRY	<2.1
Perfluorooctane Sulfonic Acid (**PFOS**-LN)		--	**110**	**150**	**230**	**130**	**180**	DRY	DRY	<2.1
Perfluorooctane Sulfonic Acid (**PFOS**-BR)		--	**91**	**88**	**230**	**140**	**130**	DRY	DRY	<2.1
Perfluoroundecanoic Acid (PFUnDA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	**2.6**
Perfluorononane Sulfonic Acid (PFNS)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
Perfluorododecanoic Acid (PFDoDA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	**4.3**
Perfluorodecane Sulfonic Acid (PFDS)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
Perfluorotridecanoic Acid (PFTrDA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	**2.2**
Perfluorooctane Sulfonamide (FOSA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
Perfluorotetradecanoic Acid (PFTeDA)		--	<10	<4.0	<4.1	<3.9	<3.9	DRY	DRY	**3.1 J**
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid (9Cl-PF3ONS)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)		--	<10	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.1
Hexafluoropropylene oxide dimer (HFPO-DA)		--	<10	<2.0	<2.0	<2.0	<9.9	DRY	DRY	<11
Total Per-and Polyfluoroalkyl Substances		--	**225.0**	**253.3**	**517.5**	**348.2**	**387.9**			**80.0**

Notes
1) Detections in **bold**.
2) Concentrations in ng/L.
3) < = Not detected at specified reporting limit.
4) -- = Not analyzed/No criteria.
5) Dup = Duplicate sample.
6) EGLE Part 201 Groundwater Generic Cleanup Criteria and Screening Levels, December 21, 2020 and Rule 57 Surface Water Quality Values.
7) Concentration above the groundwater surface water interface (GSI) criteria are highlighted in yellow.
8) J - Estimated value less than reporting limit, but greater than MDL.
9) Light gray header are post lining sampling event result.
10) QA/QC Samples were either not detected above the reporting limit or below the EGLE Part 201 Groundwater Generic Cleanup Criteria.
11) MH-18 storm sewer line has been dry since it was lined.
12) SS-10 is located in the manhole north of SS-06 along Saginaw Road and provides better access.

FIGURES



AREA OF DETAIL

KEY MAP

Map Scale: 1:1:24,000;
Map Center: 83°41'9"W 43°5'51"N

- Ponds
- Site Buildings
- Landfill
- Former Powerhouse
- Former Plant
- Property

0 1,000 2,000 Feet

SITE LOCATION

RACER TRUST
Coldwater Road Landfill
Flint, Michigan

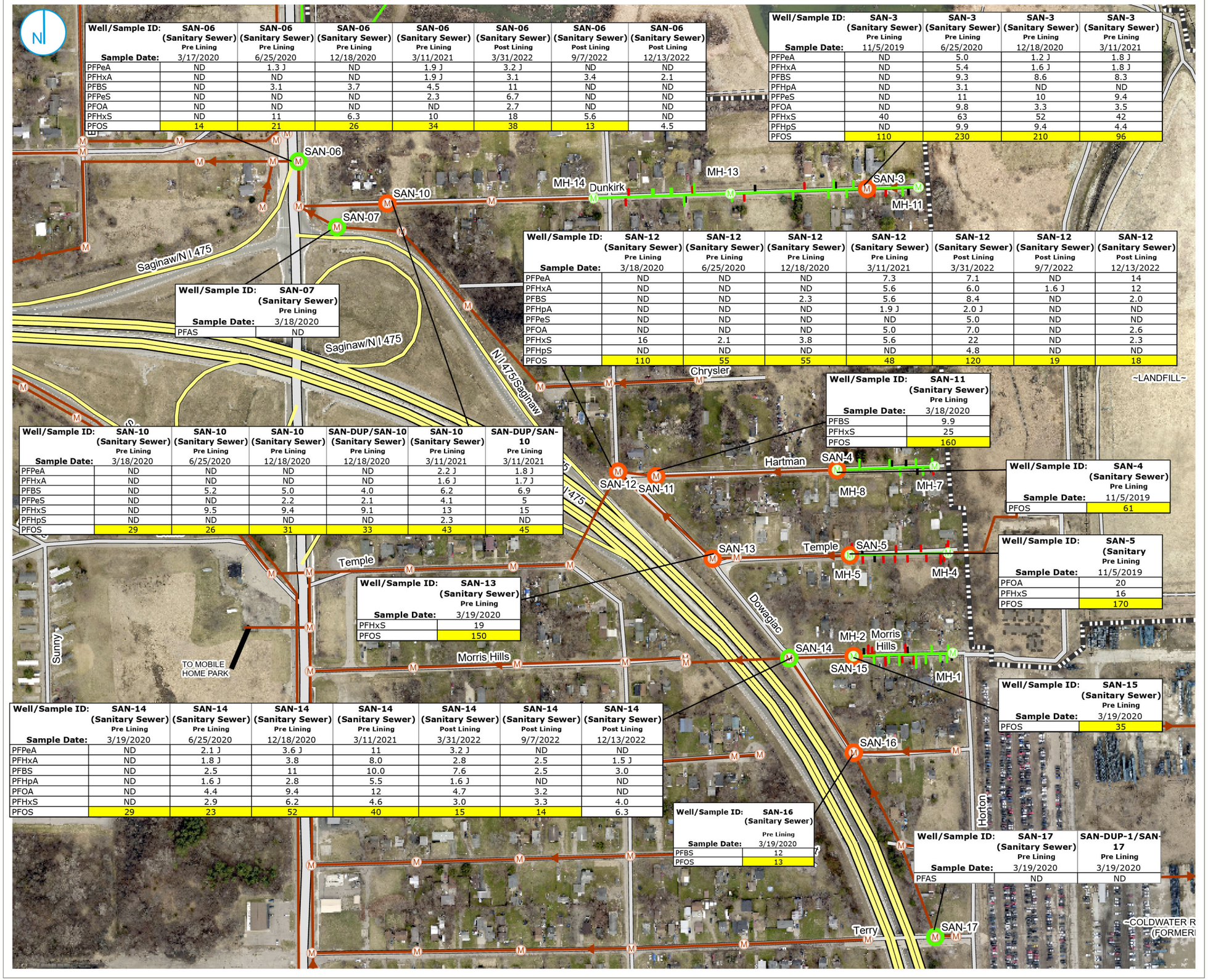
FIGURE 01

A RAMBOLL COMPANY

RAMBOLL

PROJECT: 169000XXXX | DATED: 8/11/2020 | DESIGNER: MONETANT

I:\Racer-Trust.15388\75178.Coldwater-2020\Docs\Reports\LDS\Semi-Annual Jun 2020\Figure\001 - Site_Location SA Rpts (2020-08)_08112020.mxd



Well/Sample ID:	SAN-06 (Sanitary Sewer) Pre Lining	SAN-06 (Sanitary Sewer) Pre Lining	SAN-06 (Sanitary Sewer) Pre Lining	SAN-06 (Sanitary Sewer) Pre Lining	SAN-06 (Sanitary Sewer) Post Lining	SAN-06 (Sanitary Sewer) Post Lining	SAN-06 (Sanitary Sewer) Post Lining
Sample Date:	3/17/2020	6/25/2020	12/18/2020	3/11/2021	3/31/2022	9/7/2022	12/13/2022
PFPeA	ND	1.3 J	ND	1.9 J	3.2 J	ND	ND
PFHxA	ND	ND	ND	1.9 J	3.1	3.4	2.1
PFBS	ND	3.1	3.7	4.5	11	ND	ND
PFPeS	ND	ND	ND	2.3	6.7	ND	ND
PFOA	ND	ND	ND	ND	2.7	ND	ND
PFHxS	ND	11	6.3	10	18	5.6	ND
PFOS	14	21	26	34	38	13	4.5

Well/Sample ID:	SAN-3 (Sanitary Sewer) Pre Lining	SAN-3 (Sanitary Sewer) Pre Lining	SAN-3 (Sanitary Sewer) Pre Lining	SAN-3 (Sanitary Sewer) Pre Lining
Sample Date:	11/5/2019	6/25/2020	12/18/2020	3/11/2021
PFPeA	ND	5.0	1.2 J	1.8 J
PFHxA	ND	5.4	1.6 J	1.8 J
PFBS	ND	9.3	8.6	8.3
PFHpA	ND	3.1	ND	ND
PFPeS	ND	11	10	9.4
PFOA	ND	9.8	3.3	3.5
PFHxS	40	63	52	42
PFHpS	ND	9.9	9.4	4.4
PFOS	110	230	210	96

Well/Sample ID:	SAN-12 (Sanitary Sewer) Pre Lining	SAN-12 (Sanitary Sewer) Pre Lining	SAN-12 (Sanitary Sewer) Pre Lining	SAN-12 (Sanitary Sewer) Pre Lining	SAN-12 (Sanitary Sewer) Post Lining	SAN-12 (Sanitary Sewer) Post Lining	SAN-12 (Sanitary Sewer) Post Lining
Sample Date:	3/18/2020	6/25/2020	12/18/2020	3/11/2021	3/31/2022	9/7/2022	12/13/2022
PFPeA	ND	ND	ND	7.3	7.1	ND	14
PFHxA	ND	ND	ND	5.6	6.0	1.6 J	12
PFBS	ND	ND	2.3	5.6	8.4	ND	2.0
PFHpA	ND	ND	ND	1.9 J	2.0 J	ND	ND
PFPeS	ND	ND	ND	ND	5.0	ND	ND
PFOA	ND	ND	ND	5.0	7.0	ND	2.6
PFHxS	16	2.1	3.8	5.6	22	ND	2.3
PFHpS	ND	ND	ND	ND	4.8	ND	ND
PFOS	110	55	55	48	120	19	18

Well/Sample ID:	SAN-07 (Sanitary Sewer) Pre Lining
Sample Date:	3/18/2020
PFAS	ND

Well/Sample ID:	SAN-11 (Sanitary Sewer) Pre Lining
Sample Date:	3/18/2020
PFBS	9.9
PFHxS	25
PFOS	160

Well/Sample ID:	SAN-10 (Sanitary Sewer) Pre Lining	SAN-10 (Sanitary Sewer) Pre Lining	SAN-10 (Sanitary Sewer) Pre Lining	SAN-DUP/SAN-10 (Sanitary Sewer) Pre Lining	SAN-10 (Sanitary Sewer) Pre Lining	SAN-DUP/SAN-10 Pre Lining
Sample Date:	3/18/2020	6/25/2020	12/18/2020	12/18/2020	3/11/2021	3/11/2021
PFPeA	ND	ND	ND	ND	2.2 J	1.8 J
PFHxA	ND	ND	ND	ND	1.6 J	1.7 J
PFBS	ND	5.2	5.0	4.0	6.2	6.9
PFPeS	ND	ND	2.2	2.1	4.1	5
PFHxS	ND	9.5	9.4	9.1	13	15
PFHpS	ND	ND	ND	ND	2.3	ND
PFOS	29	26	31	33	43	45

Well/Sample ID:	SAN-4 (Sanitary Sewer) Pre Lining
Sample Date:	11/5/2019
PFOS	61

Well/Sample ID:	SAN-5 (Sanitary Pre Lining
Sample Date:	11/5/2019
PFOA	20
PFHxS	16
PFOS	170

Well/Sample ID:	SAN-13 (Sanitary Sewer) Pre Lining
Sample Date:	3/19/2020
PFHxS	19
PFOS	150

Well/Sample ID:	SAN-14 (Sanitary Sewer) Pre Lining	SAN-14 (Sanitary Sewer) Pre Lining	SAN-14 (Sanitary Sewer) Pre Lining	SAN-14 (Sanitary Sewer) Pre Lining	SAN-14 (Sanitary Sewer) Post Lining	SAN-14 (Sanitary Sewer) Post Lining	SAN-14 (Sanitary Sewer) Post Lining
Sample Date:	3/19/2020	6/25/2020	12/18/2020	3/11/2021	3/31/2022	9/7/2022	12/13/2022
PFPeA	ND	2.1 J	3.6 J	11	3.2 J	ND	ND
PFHxA	ND	1.8 J	3.8	8.0	2.8	2.5	1.5 J
PFBS	ND	2.5	11	10.0	7.6	2.5	3.0
PFHpA	ND	1.6 J	2.8	5.5	1.6 J	ND	ND
PFOA	ND	4.4	9.4	12	4.7	3.2	ND
PFHxS	ND	2.9	6.2	4.6	3.0	3.3	4.0
PFOS	29	23	52	40	15	14	6.3

Well/Sample ID:	SAN-16 (Sanitary Sewer) Pre Lining
Sample Date:	3/19/2020
PFBS	12
PFOS	13

Well/Sample ID:	SAN-15 (Sanitary Sewer) Pre Lining
Sample Date:	3/19/2020
PFOS	35

Well/Sample ID:	SAN-17 (Sanitary Sewer) Pre Lining	SAN-DUP-1/SAN-17 Pre Lining
Sample Date:	3/19/2020	3/19/2020
PFAS	ND	ND

- SANITARY SEWER MANHOLE
- SANITARY SEWER SAMPLE LOCATION EXCEEDING CRITERIA
- SANITARY SEWER SAMPLE LOCATION NOT EXCEEDING CRITERIA
- SANITARY SEWER MANHOLE LINED
- NO LINER VIDEO
- LINED
- CONTRACTOR INDICATES LINED; NO VIDEO TO CONFIRM
- CAPPED LATERAL
- SANITARY SEWER
- FORMER BUILDING
- PROPERTY BOUNDARY

Notes

Concentrations in ng/L.
Dup = Duplicate sample
ND = Not detected
Concentrations above the EGLE Rule 57 Surface Water Quality Values - Non-Drinking Water criteria are highlighted in yellow.
Results shown are all detected results at a location.

0 150 300 Feet

SANITARY SEWER / MANHOLE SAMPLE LOCATIONS

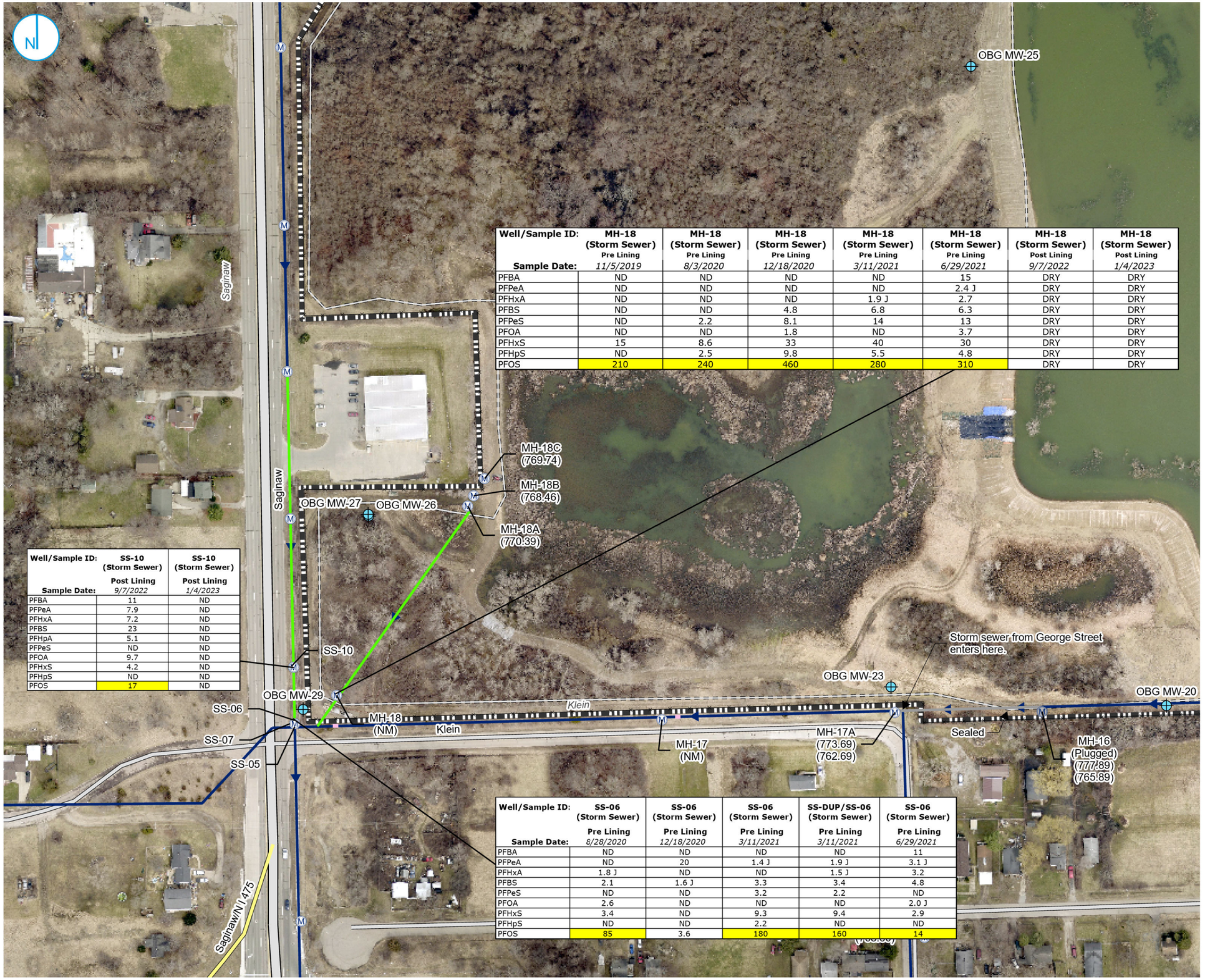
RACER TRUST
COLDWATER ROAD
FLINT, MICHIGAN

FIGURE 02

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1940104S | DATED: 3/6/2023 | DESIGNER: MONETAIT
I:\Racer-Trust.1088190\GIS\Coldwater_Road\ProjRACER_Coldwater_Road_2022_Annual_LDS_and_GW_Figures.aprx\Figure 2 - Sanitary Sewer Manhole Sample Locations_02022023



Well/Sample ID:	MH-18 (Storm Sewer) Pre Lining	MH-18 (Storm Sewer) Pre Lining	MH-18 (Storm Sewer) Pre Lining	MH-18 (Storm Sewer) Pre Lining	MH-18 (Storm Sewer) Pre Lining	MH-18 (Storm Sewer) Post Lining	MH-18 (Storm Sewer) Post Lining
Sample Date:	11/5/2019	8/3/2020	12/18/2020	3/11/2021	6/29/2021	9/7/2022	1/4/2023
PFBA	ND	ND	ND	ND	15	DRY	DRY
PFPeA	ND	ND	ND	ND	2.4 J	DRY	DRY
PFHxA	ND	ND	ND	1.9 J	2.7	DRY	DRY
PFBS	ND	ND	4.8	6.8	6.3	DRY	DRY
PFPeS	ND	2.2	8.1	14	13	DRY	DRY
PFOA	ND	ND	1.8	ND	3.7	DRY	DRY
PFHxS	15	8.6	33	40	30	DRY	DRY
PFHpS	ND	2.5	9.8	5.5	4.8	DRY	DRY
PFOS	210	240	460	280	310	DRY	DRY

Well/Sample ID:	SS-10 (Storm Sewer) Post Lining	SS-10 (Storm Sewer) Post Lining
Sample Date:	9/7/2022	1/4/2023
PFBA	11	ND
PFPeA	7.9	ND
PFHxA	7.2	ND
PFBS	23	ND
PFHpA	5.1	ND
PFPeS	ND	ND
PFOA	9.7	ND
PFHxS	4.2	ND
PFHpS	ND	ND
PFOS	17	ND

Well/Sample ID:	SS-06 (Storm Sewer) Pre Lining	SS-06 (Storm Sewer) Pre Lining	SS-06 (Storm Sewer) Pre Lining	SS-DUP/SS-06 (Storm Sewer) Pre Lining	SS-06 (Storm Sewer) Pre Lining
Sample Date:	8/28/2020	12/18/2020	3/11/2021	3/11/2021	6/29/2021
PFBA	ND	ND	ND	ND	11
PFPeA	ND	20	1.4 J	1.9 J	3.1 J
PFHxA	1.8 J	ND	ND	1.5 J	3.2
PFBS	2.1	1.6 J	3.3	3.4	4.8
PFPeS	ND	ND	3.2	2.2	ND
PFOA	2.6	ND	ND	ND	2.0 J
PFHxS	3.4	ND	9.3	9.4	2.9
PFHpS	ND	ND	2.2	ND	ND
PFOS	85	3.6	180	160	14

- MONITORING WELL / PIEZOMETER
- STORM SEWER MANHOLE
- MANHOLE ABANDONED AND PLUGGED
- CATCH BASIN
- VAULT
- STORM SEWER PIPE PLUG
- STORM SEWER
- PROPERTY BOUNDARY
- (800.93) GROUND ELEVATION
- (798.00) INVERT ELEVATION
- ABANDONED SEWER
- LINED SEWER

Notes

Concentrations in ng/L.
ND = Not detected
Concentrations above the EGLE Rule 57 Surface Water Quality Values - Non-Drinking Water criteria are highlighted in yellow.
Results shown are all detected results at a location.
NM indicates not measured.
Locations that do not have an invert measurement only the ground elevation is listed.

0 75 150
Feet

KLEIN STREET AREA STORM SEWER CONFIGURATION

RACER TRUST
COLDWATER ROAD
FLINT, MICHIGAN

DRAFT FIGURE 03

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

I:\Racer-Trust.1088190\GIS\Coldwater_Road\Pro\RACER_Coldwater_Road_2022_Annual_LDS_and_GW_Figures.aprx\Figure 3 - Klein St Area Storm Sewer Configuration1
PROJECT: 1689000XXXX | DATED: 3/6/2023 | DESIGNER: MONETANIT

APPENDIX A
CONSTRUCTION PHOTO LOG

Location: Hartman Street	
Picture of manhole MH-8 after being sealed.	
Location: Dunkirk Avenue	
Picture of manhole MH-13 after being sealed.	

Location: Onsite West of Ponds Picture of manhole MH-18A after being sealed/patched. Looking Southwest	
Location: Onsite West of Ponds Picture of manhole MH-18B after being sealed. Looking Northwest	

Location: Saginaw Road Storm sewer lining installation along Saginaw Road. Looking Southwest.	
Location: Saginaw Road Storm sewer lining installation along Saginaw Road. Looking Southwest.	

Location: Saginaw Road Storm sewer lining installation along Saginaw Road. Looking North.	
Location: Saginaw Road Storm sewer lining installation along Saginaw Road. Looking North.	

Location: Saginaw Road Storm sewer lining installation along Saginaw Road. Looking North.	
Location: Saginaw Road Storm sewer lining installation along Saginaw Road. Looking South.	

Location: Dunkirk Avenue	
Sanitary lateral sewer lining along Dunkirk Avenue. Looking West.	

APPENDIX B
AS-BUILT PLAN VIEW DRAWINGS

RACER TRUST SEWER REHABILITATION
WEST OF COLDWATER ROAD SITE
100 PERCENT DESIGN

NAD 83

GENESEE TOWNSHIP, MICHIGAN

VICINITY MAP

SCALE: 1" = 2000'

INDEX OF DRAWINGS		
SHEET NO.	SHEET DESIGNATION	SHEET TITLE
1	G-01	COVER SHEET
2	G-02	GENERAL NOTES
3	G-03	KEY SHEET & LEGEND
4	G-04	REHABILITATION TABLE AND NOTES
5	C-01	PLAN - DUNKIRK AVENUE
6	C-02	PLAN & PROFILE- HARTMAN STREET & TEMPLE AVENUE
7	C-03	PLAN - MORRIS HILLS PWKY & STORM SEWER REHABILITAITON AREA
8	C-04	CIVIL DETAILS

THE CONTRACTOR UNDERSTANDS THAT THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE), AND REVITALIZING AUTO COMMUNITIES ENVIRONMENTAL RESPONSE (RACER) TRUST HAVE ENTERED INTO AN APPROVED SCOPE OF WORK THAT IN PART STIPULATES THE PROTECTION OF WATERS IN THE STATE OF MICHIGAN FROM PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) AND THAT RACER TRUST SHALL INCUR SIGNIFICANT AND SUBSTANTIAL COST PURSUANT OF CORRECTIVE MEASURES IN THE EVENT SEWAGE IS DISCHARGED ONTO THE GROUND OR INTO ANY STREAMS IN CONNECTION WITH THIS CONTRACT. ANY COST INCURRED BY THE OWNER, RACER TRUST, AND ENGINEER, ALONG WITH ANY AND ALL OTHER DAMAGES, COSTS AND EXPENSES OF THE OWNER, RACER TRUST, AND ENGINEER, SHALL BE THE LIABILITY AND OBLIGATION OF THE CONTRACTOR UNDER THIS CONTRACT.

PROJECT ISSUE DATE

DATE: 05/26/2021

AS-BUILT

DATE: 01/31/2023

CLIENT: RACER TRUST

NO.	DATE	REVISION	INT.
0	05/25/2021	ISSUED FOR BID	RRB

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE: RRB

DESIGNED BY: CSY
CHECKED BY: MLH & REB
DRAWN BY: ZKL
FILE NO.: 33456.75178
DATE: 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS: GENESEE TOWNSHIP, MICHIGAN

SHEET DESCRIPTION: COVER SHEET
DRAWING LOCATION: 75178_1001

G-01

GENERAL NOTES

1. A CONSTRUCTION SCHEDULE SHALL BE SUBMITTED TO DAVID FAVERO, DEPUTY CLEANUP MANAGER - MICHIGAN RACER TRUST AT THE TIME OF THE PRE-CONSTRUCTION CONFERENCE.

2. SUBMITTALS ON MATERIALS FOR THIS PROJECT SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION.

3. THE REHABILITATION WORK FOR THIS PROJECT SHALL BE COMPLETED AS IDENTIFIED IN THE REQUEST FOR PROPOSAL (RFP) AND CONTRACT DOCUMENTS (PLANS AND TECHNICAL SPECIFICATIONS) FOR THIS PROJECT.

4. CONTRACTOR SHALL HAVE A COMPLETE SET OF CONTRACT DOCUMENTS (PLANS AND SPECIFICATIONS) ON SITE AT ALL TIMES.

5. BASE MAPPING FOR THIS PROJECT WAS DEVELOPED USING NAD83 / MICHIGAN SOUTH (FT) GIS DATA COORDINATE SYSTEM.

6. THE LOCATIONS OF THE UTILITIES SHOWN ON THESE DRAWINGS ARE FROM THE AVAILABLE GIS DATA AND/OR THE BEST AVAILABLE INFORMATION OBTAINED AT THE TIME OF DESIGN. THIS INFORMATION IS NOT NECESSARILY COMPLETE, AND LOCATIONS OF THE UTILITIES SHOWN SHOULD BE CONSIDERED APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY EXISTING CONDITIONS TO THEIR SATISFACTION PRIOR TO INITIATING ANY WORK ACTIVITIES. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING UTILITIES, STRUCTURES, OR OTHER FEATURES LOCATED NEAR WORK ACTIVITIES. DAMAGE TO EXISTING UTILITIES AS A RESULT OF CONTRACTOR WORK ACTIVITIES SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

7. WHEN EXCAVATION IS REQUIRED, CONTRACTOR SHALL NOTIFY MISS DIG 811 (1-800-482-7171). A MINIMUM OF 72-HOURS PRIOR TO START OF EXCAVATION TO DETERMINE THE LOCATION OF EXISTING UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TEST PITTING DETERMINED NECESSARY TO VERIFY THE SIZE, ELEVATION, LOCATION AND TYPE OF UTILITIES PRIOR TO PERFORMING ANY WORK THAT MAY IMPACT THESE UTILITIES. ANY UTILITY, WHETHER SHOWN OR NOT, THAT IS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AT NO EXPENSE TO RACER TRUST. RAMBOLL IS TO BE ADVISED IMMEDIATELY OF ANY DISCREPANCIES IDENTIFIED BETWEEN THE CONTRACT DOCUMENTS AND FIELD CONDITIONS. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT THE AUTHORIZATION OF THE OWNER, THE CONTRACTOR ASSUMES THE RESPONSIBILITY FOR SAID CORRECTIONS OR ADJUSTMENTS.

8. THE EXISTENCE AND SUBSEQUENT LOCATIONS OF UNDERGROUND UTILITIES (ELECTRIC, WATER, ETC.) ON PRIVATE PROPERTY IS UNKNOWN. CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE EXISTING UTILITIES ON PRIVATE PROPERTIES (AS NECESSARY), DEPENDING ON THE LIMITS AND LOCATIONS OF WORK ACTIVITIES. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGING THESE UTILITIES AND ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.

9. CONTRACTOR IS ENCOURAGED TO MAKE AN ON-SITE INSPECTION OF THE AREAS REQUIRING REHABILITATION/ POINT REPAIR REPLACEMENT AND ANY RELATED CONDITIONS THAT MAY IMPACT THEIR WORK, INCLUDING ACCESS REQUIREMENTS, PRIOR TO BIDDING THE PROJECT. CONTRACTOR SHALL NOTIFY THE CLIENT: RACER TRUST AT LEAST 24-HOURS PRIOR TO VISITING THE SITE FOR THIS INSPECTION. SUBMISSION OF A BID SHALL SERVE AS ACKNOWLEDGEMENT OF THE CONDITIONS REQUIRED TO COMPLETE THE WORK AND ACCURACY OF THE BID.

10. THE LOCATION OF FEATURES SHOWN ON THESE DRAWINGS ARE PROVIDED ONLY FOR THE CONVENIENCE OF THE CONTRACTOR, AND THE CLIENT: RACER TRUST DOES NOT WARRANT AND/OR GUARANTEE THE ACCURACY OR COMPLETENESS OF THE INFORMATION. CONTRACTOR SHALL FIELD VERIFY TO THEIR SATISFACTION THE WORK REQUIREMENTS ASSOCIATED WITH ALL LOCATIONS, INCLUDING DIMENSIONS OF ANY EXISTING UTILITIES, FEATURES AND/OR STRUCTURES RELATED TO PROJECT CONSTRUCTION PRIOR TO ORDERING MATERIALS OR COMMENCING WORK.

11. CONSTRUCTION ACTIVITIES ARE TO BE PERFORMED WITHIN ALL EASEMENTS AND RIGHTS-OF-WAY SHOWN ON THE DRAWINGS UNLESS OTHERWISE NOTED. WORK OUTSIDE OF EASEMENT/RIGHT-OF-WAY AREAS SHALL BE NEGOTIATED BY THE CONTRACTOR WITH THE RESPECTIVE PROPERTY OWNER OF THE RESPECTIVE PARCEL(S). CONTRACTOR IS ALSO RESPONSIBLE FOR COORDINATING ALL SITE ACCESS REQUIREMENTS, PERMITS, TEMPORARY SHUT-DOWNS, AND BYPASS ROUTING REQUIREMENTS WITH IMPACTED PROPERTY OWNERS AS NECESSARY TO COMPLETE THE WORK.

12. FOR LOCATIONS ASSOCIATED WITH THE WORK REQUIRED OF THIS PROJECT THAT MAY BE LOCATED ON PRIVATE PROPERTY, TEMPORARY ACCESS MAY BE REQUIRED TO COMPLETE THE WORK. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE PROPERTY OWNERS AND DETERMINE ANY SPECIFIC ACCESS OR LAND USE REQUIREMENTS, AS NEEDED TO COMPLETE THE WORK. ALL COSTS ASSOCIATED WITH LAND USE NOT COVERED BY PERMITS INCLUDED IN THE BID PACKAGE (INCLUDING BUT NOT LIMITED TO PERMITS, INSTALLING ACCESS ROUTES SUITABLE FOR COMPLETION OF THE WORK, WORK SCHEDULES, SITE RESTORATION, ETC.) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTACT WITH PROPERTY OWNERS SHALL BE COMPLETED EARLY IN THE PROJECT SO AS NOT TO IMPACT THE COMPLETION OF THE WORK.

13. CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING SILT AND DEBRIS OUT OF THE STORM DRAINAGE SYSTEM, STREAMS, RIVERS, ETC. FOR THE DURATION OF THE PROJECT. LIQUID WASTE, AGGREGATE, GRIT AND DEBRIS REMOVED THROUGH CLEANING OPERATIONS FROM THE SANITARY SEWER SHALL BE CONSIDERED TO BE PER- AND POLYFLUOROALKYL SUBSTANCE IMPACTED UNLESS TESTED TO PROVE OTHERWISE. AND SHALL BE DISPOSED OF BY AN APPROVED SOURCE PER SPECIFICATION REQUIREMENTS.

14. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE CAUSED TO EXISTING LANDSCAPING, ROADS, DRIVEWAYS, CULVERTS, DRAINAGE DITCHES, DRAIN FIELDS, UTILITIES, PIPES, STRUCTURES AND EQUIPMENT WHICH OCCURS BECAUSE OF PROJECT CONSTRUCTION. ANY ITEM DAMAGED BY WORK ACTIVITIES SHALL BE REPAIRED TO EITHER PRECONSTRUCTION CONDITION OR REPLACED IN KIND.

15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS AND ALLEYS OF DUST AND TAKE WHATEVER MEASURES NECESSARY TO ENSURE THAT ALL ROADS ARE MAINTAINED IN A MUD AND DUST FREE CONDITION AT ALL TIMES.

16. EXCAVATION ASSOCIATED WITH THIS SEWER REHABILITATION PROJECT IS INTENDED TO OCCUR ONLY WHERE SHOWN ON THESE PLANS. SHOULD ADDITIONAL EXCAVATION BE REQUIRED, CONTRACTOR SHALL COORDINATE WITH AND OBTAIN APPROVAL FROM THE OWNER PRIOR TO PERFORMING THE WORK.

17. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE LATEST VERSION OF THE REQUIREMENTS SET FORTH BY THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT0 STANDARD SPECIFICATIONS FOR CONSTTRUCTION.

18. CONTRACTOR SHALL BE RESPONSIBLE FOR ADHERING TO ALL MAINTENANCE OF TRAFFIC (MOT) REQUIREMENTS AND FOR OBTAINING ANY REQUIRED PERMITS NECESSARY TO COMPLETE THEIR WORK. RIGHT-OF-WAY PERMITS CAN BE OBTAINED FROM GENESEE COUNTY'S ONLINE PERMIT SYSTEM KNOWN AS OXCART (HTTPS://WWW.OXCARTPERMITS.COM/).

19. EXISTING SEWER SERVICE SHALL BE MAINTAINED AT ALL TIMES DURING THE COURSE OF CONSTRUCTION. AT NO TIME WILL IT BE PERMITTED FOR SEWAGE TO BE DISCHARGED ONTO THE GROUND, INTO STREAMS, OR ANY AREAS OTHER THAN A SANITARY SEWER. CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING BYPASS PUMPING PLANS FOR APPROVAL FROM RACER TRUST. CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY EQUIPMENT (PLUGGING, PUMPING, CONTAINMENT, ETC.) FOR BYPASSING ACTIVITIES NECESSARY FOR THIS PROJECT.

20. SHOULD ANY LIQUID OR SOLID MATTER FROM THE SEWER COLLECTION SYSTEM BE SPILLED, DISCHARGED, LEAKED OR OTHERWISE DEPOSITED TO THE OPEN ENVIRONMENT AS A RESULT OF THE CONTRACTOR'S OPERATIONS, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CLEANUP AND DISINFECTION OF THE AFFECTED AREA AND ALL ASSOCIATED COSTS, INCLUDING ANY FINES OR PENALTIES RESULTING FROM THE DISCHARGE. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR NOTIFYING RAMBOLL, AND RAMBOLL NOTIFY RACER TRUST AND GENESEE COUNTY DRAINS COMMISSIONER. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL REQUIRED CLEANUP OPERATIONS AT NO ADDITIONAL COST TO RACER TRUST. ANY SEWER SPILLS SHALL BE REPORTED WITHIN 24 HOURS TO THE DIVISION OF WATER AND WASTE SERVICES AT OFFICE NUMBER: (810) 732-1590, FAX NUMBER: (810) 732-1474, AFTER HOURS EMERGENCY: (810) 732-2940. CONTRACTOR MUST SUBMIT A COPY OF AN INCIDENT REPORT TO THE PROJECT INSPECTOR/ ENGINEER WITHIN 24 HOURS OF EVENT. CHEMICAL DISCHARGES (FUELS, HYDRAULIC OIL, ETC.), DEPENDING ON THE SIZE AND NATURE, SHALL ALSO BE REPORTED TO EGLE. IF REPORTING AN ENVIRONMENTAL EMERGENCY, SPILL OR RELEASE INVOLVING WATER, GROUNDWATER, WETLANDS, OIL, LAND OR AIR, CONTRACTOR SHALL CONTACT THE PEAS HOTLINE IMMEDIATELY [24/7]: STATE OF MICHIGAN EGLE POLLUTION EMERGENCY ALERTING SYSTEM [PEAS] HOTLINE: 800-292-4706. MANY INCIDENTS ALSO WARRANT REPORTING TO THE FEDERAL NATIONAL RESPONSE CENTER WHICH SERVES THE U.S. EPA AND THE U. S. COAST GUARD: FEDERAL NRC HOTLINE: (800) 424-8802. CONTRACTOR SHALL CONFIRM WITH ENGINEER WHO SHALL BE CONTACTED.

21. CONTRACTOR SHALL NOTIFY BUSINESSES AND HOMEOWNERS 72-HOURS PRIOR TO ANY SERVICE INTERRUPTIONS. SERVICE INTERRUPTIONS SHALL BE KEPT TO A MINIMUM.

22. CONTRACTOR SHALL REPORT TO RACER TRUST, AND WHEN IN THE COUNTY ROADS RIGHT OF WAY, GENESEE COUNTY ROAD COMMISSION (GCRC) DEPARTMENT OF ENGINEERING, CONSTRUCTION, DESIGN & TRAFFIC, ALL INCIDENTS/COMPLAINTS FROM RESIDENTS REGARDING PROPERTY DAMAGE RESULTING FROM CONTRACTOR WORK OR ANY BACKUPS OF SEWAGE INTO DWELLING/BUSINESSES. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY AT CONTRACTOR'S EXPENSE. CONTRACTOR MUST COMPLETE BASEMENT BACKUP INCIDENT REPORT (SEE SPECIFICATIONS) AND PROVIDE TO INSPECTOR WITHIN 24 HOURS.

23. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF EXCAVATIONS, UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER. EXCAVATIONS WHICH ARE TO BE LEFT OPEN OVERNIGHT, OR WHEN CONTRACTOR'S FORCES ARE NOT PRESENT, SHALL BE APPROVED BY THE ENGINEER AND SO PROTECTED OR ENCLOSED AND EFFECTIVELY MARKED TO PRESENT NO DANGER TO THE PUBLIC OR OTHER VISITORS TO THE AREA. EXCAVATIONS OCCURRING IN THE ROADWAY SHALL HAVE PLATES PLACED OVER THE EXCAVATED SITE WHEN CONTRACTOR IS NOT PRESENT. SILT FENCING SHALL BE PLACED ON THE DOWNHILL SIDE OF ANY AREA TO BE WORKED BY CONTRACTOR'S FORCES, AS MAY BE REQUIRED.

24. CONTRACTOR SHALL NOT PENETRATE, CONNECT, OR DEMOLISH ANY EXISTING SEWERS OR ASSOCIATED STRUCTURES WITHOUT PRIOR APPROVAL FROM THE OWNER: RACER TRUST, AND THE GCRC DEPARTMENT OF ENGINEERING, CONSTRUCTION, DESIGN & TRAFFIC RIGHT OF WAY.

25. CONTRACTOR SHALL PERFORM ALL REQUIRED SEWER CLEANING AND CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION OF ALL PIPE SEGMENTS TO BE REPAIRED AS PART OF THIS PROJECT IN ADVANCE OF INITIATING CONSTRUCTION ACTIVITIES. SEWER CLEANING AND CCTV INSPECTIONS SHALL BE AS DESCRIBED IN THE CONTRACT SPECIFICATIONS TO DETERMINE/CONFIRM PIPE DIMENSIONS, ALIGNMENT, CONNECTION LOCATIONS, PIPELINE/CONNECTION CONDITIONS, AND ANY OTHER ABNORMALITIES OR CONDITIONS THAT WOULD AFFECT THE PROPOSED REPAIR/REHABILITATION/REPLACEMENT PROCESS. DAMAGE CAUSED BY THE CLEANING EQUIPMENT SHALL BE THE RESPONSIBILITY OF CONTRACTOR AND REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.

26. CONTRACTOR SHALL TAKE NOTE OF THE DATE (2020) OF THE CCTV INSPECTION VIDEOS THAT WERE PROVIDED BY RACER TRUST AND UTILIZED TO MAKE SEWER REHABILITATION RECOMMENDATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING NEW PRE-CCTV INSPECTIONS AND DETERMINING IF ANY OF THE SEWER CONDITIONS HAVE SIGNIFICANTLY CHANGED SINCE THE CCTV INSPECTIONS WERE ORIGINALLY CONDUCTED THAT WOULD IMPACT THE WORK. ANY DIFFERING CONDITIONS SHOULD BE IMMEDIATELY BROUGHT TO THE ATTENTION OF RAMBOLL AND RACER TRUST ALONG WITH ALTERNATIVE REPAIR RECOMMENDATIONS SUBMITTED FOR CONSIDERATION.

27. IT IS THE INTENT OF THIS CONTRACT TO COMPLETE THE REHABILITATION/REPAIR WORK WITH MINIMAL EXCAVATION WHEREVER POSSIBLE. OPEN-CUT EXCAVATION POINT REPAIRS SHOULD ONLY BE MADE WHEN INDICATED ON THE CONTRACT DOCUMENTS.

28. THE LOCATION OF HOUSE CONNECTIONS SHOWN ON THE DRAWINGS ARE FOR INFORMATION ONLY. THE EXACT NUMBER AND LOCATION OF THE SANITARY HOUSE CONNECTIONS (SHC) SHALL BE DETERMINED AS PART OF THE PRE-CCTV INSPECTIONS. INACTIVE LATERALS SHALL BE CONFIRMED BY THE CONTRACTOR AND SHALL NOT BE REOPENED AND REHABILITATED FOLLOWING MAINLINE REHABILITATION.

29. CONTRACTOR SHALL COORDINATE WITH THE BEECHER METROPOLITAN DISTRICT (BMD) FOR WATER REQUIRED FOR SEWER CLEANING PRIOR TO CCTV INSPECTION.

CONTACT**: KEVIN FORBES**
ADMINISTRATIVE SUPERINTENDENT
BEECHER METROPOLITAN DISTRICT
G-1057 LOUIS AVENUE, FLINT MI 48505
810.787.8734 OFFICE
810.397.1697 CELL
EMAIL: KEVIN@BEECHERWATER.US

30. CONTRACTOR SHALL CONTACT GCRC FOR STORM SEWER CLEANING ALONG SAGINAW ROAD PRIOR TO CCTV INSEPCTION.

CONTACT**: COREY JARBEAU**
PERMIT SPECIALIST
GENESEE COUNTY ROAD COMMISSION
211 W OAKLEY STREET, FLINT, MI 48503
810-767-4920 EXT 25
EMAIL: CJARBEAU@GCRC.ORG

31. ALL LINING WORK SHALL BE COMPLETED DURING DRY WEATHER. NO LINING SHALL BE PERMITTED DURING RAIN EVENTS.

32. CONSUMERS ENERGY FACILITIES: THIS DOCUMENT INCLUDES INFORMATION AND DEPICTIONS OF CONSUMERS ENERGY ELECTRIC COMPANY'S ELECTRIC AND/OR GAS UTILITIES LOCATED WITHIN THE PROJECT AREA. LOCATIONS, DIMENSIONS, DEPTHS, AND OTHER DETAILS OF ANY SUCH UTILITIES MAY NOT BE AS-BUILT, AND THE INFORMATION SHALL NOT BE RELIED UPON WITHOUT FIELD VERIFICATION. EXCAVATORS MUST EMPLOY SAFE DIGGING BEST PRACTICES WHEN APPROACHING CONSUMERS ENERGY ELECTRIC AND GAS UTILITIES AND COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, INCLUDING, BUT NOT LIMITED TO, THE "MISS DIG LAW." NO REPRESENTATION, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, ARE MADE BY CONSUMERS ENERGY TO THE QUALITY, COMPLETENESS, OR ACCURACY OF THE UTILITY INFORMATION, AND IN ACCEPTING THIS DOCUMENT, THE RECIPIENT EXPRESSLY ACKNOWLEDGES AND AGREES THAT IT IS NOT RELYING ON THE ACCURACY OF THE SAME.

33. ALL EXCAVATED POINT REPAIRS AND SHALL BE COMPLETED PRIOR TO CIPP LINING WORK.

BYPASS NOTES

1. CONTRACTOR SHALL ASSUME FULL PIPE FLOW CONDITIONS FOR BYPASS. CONTRACTOR SHALL BE RESPONSIBLE FOR ACCOMMODATING ALL FLOWS AS REQUIRED TO COMPLETE THEIR WORK.

SPECIAL PROVISIONS FOR TRAFFIC CONTROL:

1. A MINIMUM SINGLE-LANE OF TRAFFIC IS REQUIRED TO BE MAINTAINED AT ALL TIMES ON ALL ROADWAYS. SINGLE-LANE OPERATIONS WILL ONLY BE ALLOWED BETWEEN THE HOURS OF 7:00 A.M. UNTIL 6:00 P.M. ON THE FOLLOWING STREETS: DUNKIRK AVENUE, HARTMAN STREET, TEMPLE AVENUE, AND MORRIS HILLS PARKWAY.

2. AT THE END OF EACH WORKDAY, CONTRACTOR IS REQUIRED TO COMPLETE THE FOLLOWING:
   a. BACKFILL AND/OR PLATE OVER ALL OPEN EXCAVATIONS SO THAT TWO LANES OF TRAFFIC ARE MAINTAINED.
   b. REMOVE ALL EQUIPMENT AND MATERIAL FROM THE TRAVELED PORTION OF THE ROADWAY. ALSO, EQUIPMENT AND MATERIALS SHOULD NOT BE STORED IN SUCH A MANNER AS TO OBSTRUCT SIGHT DISTANCE AT ANY DRIVEWAY OR INTERSECTING ROAD.
   c. COVER OR REMOVE ALL SIGNS REFERRING TO A SINGLE-LANE OPERATION. ALSO, IT MAY BE NECESSARY FOR THE CONTRACTOR TO PROVIDE "STEEL PLATES AHEAD" SIGNS ON EACH APPROACH TO THE CONSTRUCTION AREA, IF APPROPRIATE, OR AS DIRECTED BY THE INSPECTOR FOR THE PROJECT.

3. ALL EXISTING DRIVEWAY ACCESS MUST BE MAINTAINED AT ALL TIMES.

4. CONTRACTOR SHALL CONTACT THE GENESEE COUNTY ROADS COMMISSION (GCRC) FOR THE REQUIREMENTS TO WORK WITHIN THE COUNTY RIGHT-OF-WAY. IF IT IS DETERMINED THAT A TRAFFIC CONTROL PLAN IS REQUIRED, CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO SUBMIT THIS PLAN PRIOR TO STARTING ANY WORK.

5. CONTRACTOR IS TO BE RESPONSIBLE FOR THE FABRICATION, INSTALLATION AND MAINTENANCE OF ALL TRAFFIC CONTROL DEVICES. SAID DEVICES SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. ALSO, CONTRACTOR MAY BE REQUIRED TO FURNISH ADDITIONAL SIGNS SHOULD CONDITIONS WARRANT. REGARDING THE CONTROL OF TRAFFIC THROUGH WORK AREAS, PART 6 "TEMPORARY TRAFFIC CONTROL" OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION) SHALL BE UTILIZED.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING PERMANENT TRAFFIC CONTROL DEVICES IMPACTED BY THE CONSTRUCTION. DAMAGE TO THESE DEVICES AS A RESULT OF CONTRACTOR WORK ACTIVITIES SHALL BE IMMEDIATELY REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF GCRC..

PROJECT ISSUE DATE
DATE: 05/26/2021

AS−BUILT

DATE: 01/31/2023

CLIENT: RACER TRUST

NO.	DATE	REVISION	INT.

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE

DESIGNED BY: CSY
CHECKED BY: MLH & REB
DRAWN BY: ZKL
FILE NO.: 33456.75178
DATE: 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

PROJECT: SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS: GENESEE TOWNSHIP, MICHIGAN

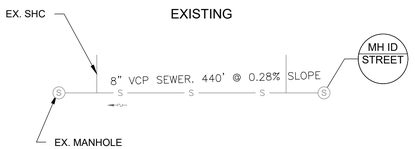
SHEET DESCRIPTION: GENERAL NOTES
DRAWING LOCATION: 75178-RACER TRUST

G-02

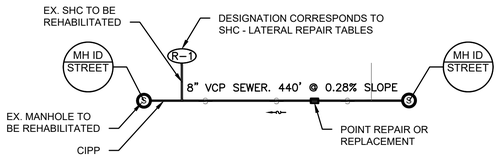
SAVED: 1/27/23 1:07 PM

LEGEND

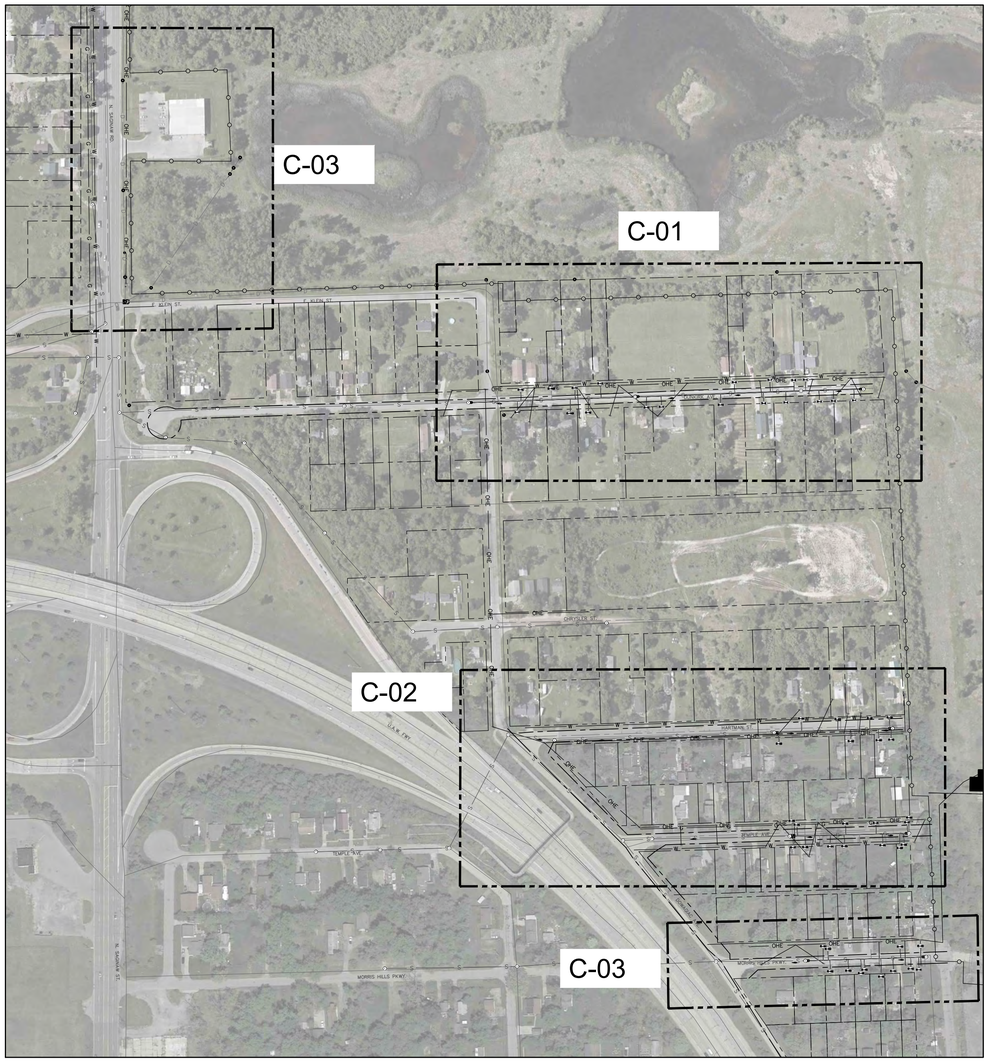
EXISTING



EXISTING SEWER TO BE REHABILITATED



- SANITARY SEWER MANHOLE
- STORM DRAIN MANHOLE
- PROPOSED POINT REPAIR
- POWER POLE
- STORM DRAIN
- WATER
- GAS
- OVERHEAD ELECTRIC
- PROPERTY LINE
- RIGHT-OF-WAY/EASEMENT



KEY MAP
SCALE: 1" = 200'

ABBREVIATIONS

BMD	=	BEECHER METROPOLITAN DISTRICT
CCTV	=	CLOSED CIRCUIT TELEVISION
CI / CIP	=	CAST IRON
CIPP	=	CURED IN PLACE PIPE
CO	=	CLEANOUT
CONC.	=	CONCRETE
CONT.	=	CONTINUATION
CP	=	CONCRETE PIPE
DI / DIP	=	DUCTILE IRON PIPE
DSMH	=	DOWNSTREAM MANHOLE
DWG.	=	DRAWING
EGLE	=	MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY
EL.	=	ELEVATION
EX.	=	EXISTING
FM	=	FORCEMAIN
FT	=	FOOT
GIS	=	GEOGRAPHIC INFORMATION SYSTEM
GCRC	=	GENESEE COUNTY ROAD COMMISSION
HORZ.	=	HORIZONTAL
INV.	=	INVERT
LH	=	LAMPHOLE
MH	=	MANHOLE
NO.	=	NUMBER
NRC	=	NATIONAL REGULATORY COMMISSION
PFAS	=	PER- AND POLYFLUOROALKYL SUBSTANCES
PVC	=	POLYVINYL CHLORIDE
RCP	=	REINFORCED CONCRETE PIPE
REHAB	=	REHABILITATION
R.O.W.	=	RIGHT OF WAY
SAN.	=	SANITARY
SHA	=	STATE HIGHWAY ADMINISTRATION
SHC	=	SANITARY HOUSE CONNECTION
STA.	=	STATION
UNK	=	UNKNOWN
USMH	=	UPSTREAM MANHOLE
VCP	=	VITRIFIED CLAY PIPE
VERT.	=	VERTICAL

PROJECT ISSUE DATE
DATE: 05/26/2021

AS-BUILT
DATE: 01/31/2023

CLIENT: RACER TRUST

NO.	DATE	REVISION	INT.
0	05/25/2021	ISSUED FOR BID	RRB

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE: RRB
DESIGNED BY: CSY
CHECKED BY: MLH & REB
DRAWN BY: ZKL
FILE NO.: 33456.75178
DATE: 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

PROJECT: SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS: GENESEE TOWNSHIP, MICHIGAN

SHEET DESCRIPTION: KEY SHEET & LEGEND
DRAWING LOCATION: 75178-RACER TRUST

G-03

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SAVED: 1/31/23 5:27 AM

MANHOLE REHABILITATION

STREET NAME	MANHOLE #	MANHOLE DEPTH*	TYPE OF REPAIR**	SHEET LOCATION
DUNKIRK AVE	MH 11	9.5	SEAL & COAT	C-01
DUNKIRK AVE	MH 13	9.0	SEAL & COAT	C-01
DUNKIRK AVE	MH 14	8.0	SEAL & COAT	C-01
HARTMAN AVE	MH 7	11.0	SEAL & COAT	C-02
HARTMAN AVE	MH 8	13.0	SEAL & COAT	C-02
TEMPLE AVE	MH 4	14.5	SEAL & COAT	C-02
TEMPLE AVE	MH 5	8.5	SEAL & COAT	C-02
MORRIS HILLS PWKY	MH 1	11.5	SEAL & COAT	C-03
MORRIS HILLS PWKY	MH 2	10.5	SEAL & COAT	C-03
STORM SEWER REHAB AREA	MH 18C	3.0	SEAL & COAT	C-03
STORM SEWER REHAB AREA	MH 18B	4.0	SEAL & COAT	C-03
STORM SEWER REHAB AREA	MH 18A	5.0	SEAL & COAT	C-03
STORM SEWER REHAB AREA	SS-06	UNKNOWN	SEAL & COAT	C-03
STORM SEWER REHAB AREA	SS-07	UNKNOWN	SEAL & COAT	C-03
STORM SEWER REHAB AREA	SS-08	UNKNOWN	SEAL & COAT	C-03
STORM SEWER REHAB AREA	SS-09	UNKNOWN	SEAL & COAT	C-03

*MANHOLE DEPTHS WERE FIELD MEASURE AND ROUNDED UP TO NEAREST 0.5-FT. CONTRACTOR SHALL VERIFY THE DEPTH OF ALL MANHOLES TO BE LINES PRIOR TO ANY WORK BEING DONE.

**ALL ACTIVE LEAKS WITHIN A MANHOLE SCHEDULED TO BE REPAIRED SHALL BE SEALED PRIOR MANHOLE COATING. THE MANHOLE SHALL BE COATED WITH CEMENTITIOUS COATING. ALL PRODUCTS USED SHALL BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

SANITARY SEWER REHABILITATION

STREET NAME	USMH	DSMH	DIAMETER (INCHES)	LENGTH (FT)	PIPE MATERIAL	TYPE OF REPAIR	SHEET LOCATION
DUNKIRK AVE	MH 11	MH 12	8	165	VCP	CIPP	C-01
DUNKIRK AVE	MH 12	MH 13	8	438	VCP	CIPP	C-01
DUNKIRK AVE	MH 13	MH 14	8	440	VCP	CIPP	C-01
HARTMAN AVE	MH 7	MH 8	8	312.5	VCP	CIPP	C-02
TEMPLE AVE	MH 4	MH 5	10	315	VCP	CIPP, POINT REPAIR*	C-02
MORRIS HILLS PWKY	MH 1	MH 2	8	318.5	VCP	CIPP	C-03

*REFER TO SITE PLAN FOR LOCATION OF POINT REPAIR

STORM SEWER REHABILITATION

STREET NAME	USMH	DSMH	DIAMETER (INCHES)	LENGTH (FT)	PIPE MATERIAL	TYPE OF REPAIR	SHEET LOCATION
STORM SEWER REHAB AREA	MH 18C	MH 18B	12	32	CONC	CIPP	C-03
STORM SEWER REHAB AREA	MH 18B	MH 18A	12	19	CONC	CIPP	C-03
STORM SEWER REHAB AREA	MH 18A	EX MH 18	12	313	CONC	CIPP	C-03
STORM SEWER REHAB AREA	SS-09	SS-08	30	290	CONC	CIPP	C-03
STORM SEWER REHAB AREA	SS-08	SS-07	36	229	CONC	CIPP	C-03

SEWER HOUSE CONNECTION - LATERAL REHABILITATION

STREET NAME	REPAIR NO.	USMH	DSMH	STATION FROM USMH	EST. LINED LATERAL LENGTH*	TYPE OF REPAIR	SHEET LOCATION
DUNKIRK AVE	R-1	MH 11	MH 12	0+25.3	24.0	CIPP	C-01
DUNKIRK AVE	R-2	MH 11	MH 12	0+79.4	0.0	NON-PERFORM IN FIELD	C-01
DUNKIRK AVE	R-3	MH 11	MH 12	1+17.3	0.0	NON-PERFORM IN FIELD	C-01
DUNKIRK AVE	R-4	MH 11	MH 12	1+52.5	0.0	NON-PERFORM IN FIELD	C-01
DUNKIRK AVE	R-5	MH 12	MH 13	0+18.2	1.0	CIPP	C-01
DUNKIRK AVE	R-6	MH 12	MH 13	0+40.7	25.0	CIPP	C-01
DUNKIRK AVE	R-7	MH 12	MH 13	0+81.1	26.0	CIPP	C-01
DUNKIRK AVE	R-8	MH 12	MH 13	0+99.3	25.0	CIPP	C-01
DUNKIRK AVE	R-9	MH 12	MH 13	1+74.9	0.0	NON-PERFORM IN FIELD	C-01
DUNKIRK AVE	R-10	MH 12	MH 13	2+12.1	25.0	CIPP	C-01
DUNKIRK AVE	R-11	MH 12	MH 13	3+69.2	0.0	NON-PERFORM IN FIELD	C-01
DUNKIRK AVE	R-12	MH 12	MH 13	4+08.4	25.0	CIPP	C-01
DUNKIRK AVE	R-13	MH 13	MH 14	0+90	25.0	CIPP	C-01
DUNKIRK AVE	R-14	MH 13	MH 14	1+62.5	24.5	CIPP	C-01
DUNKIRK AVE	R-15	MH 13	MH 14	1+23.2	24.5	CIPP	C-01
DUNKIRK AVE	R-15B	MH 13	MH 14	1+75.3	21.0	CIPP	C-01
DUNKIRK AVE	R-16B	MH 13	MH 14	2+24	0.0	NON-PERFORM IN FIELD	C-01
DUNKIRK AVE	R-16	MH 13	MH 14	3+01	0.0	NOT LINED	C-01
DUNKIRK AVE	R-17	MH 13	MH 14	3+11.2	25.0	CIPP	C-01
HARTMAN AVE	R-18	MH 7	MH 8	3+01.2	2.5	CIPP	C-02
HARTMAN AVE	R-19	MH 7	MH 8	2+40.8	24.0	CIPP	C-02
HARTMAN AVE	R-20	MH 7	MH 8	1+44.4	19.0	CIPP	C-02
HARTMAN AVE	R-21	MH 7	MH 8	1+11.1	1.0	CIPP	C-02
HARTMAN AVE	R-22	MH 7	MH 8	0+60.1	1.5	CIPP	C-02
HARTMAN AVE	R-23	MH 7	MH 8	0+37.7	24.0	CIPP	C-02
HARTMAN AVE	R-24	MH 7	MH 8	0+7.5	25.0	CIPP	C-02
HARTMAN AVE	R-25	MH 7	MH 8	0+4.6	24.0	CIPP	C-02
TEMPLE AVE	R-26	MH 4	MH 5	0+0.8	2.0	CIPP	C-02
TEMPLE AVE	R-27	MH 4	MH 5	0+3.5	2.0	CIPP	C-02
TEMPLE AVE	R-28	MH 4	MH 5	0+14.3	3.0	CIPP	C-02
TEMPLE AVE	R-29	MH 4	MH 5	0+24.9	2.0	CIPP	C-02
TEMPLE AVE	R-30	MH 4	MH 5	0+70.3	0.0	NOT LINED	C-02
TEMPLE AVE	R-31	MH 4	MH 5	0+87.1	0.0	EMPTY LOT D	C-02
TEMPLE AVE	R-32	MH 4	MH 5	1+66.8	3.0	CIPP	C-02
TEMPLE AVE	R-33	MH 4	MH 5	1+71.3	0.0	EMPTY LOT C	C-02
TEMPLE AVE	R-34	MH 4	MH 5	2+08.3	0.0	EMPTY LOT B	C-02
TEMPLE AVE	R-35	MH 4	MH 5	2+74.5	0.0	NON-PERFORM IN FIELD	C-02
TEMPLE AVE	R-36	MH 4	MH 5	2+94.6	4.5	CIPP (EMPTY LOT A)	C-02
TEMPLE AVE	R-37	MH 4	MH 5	3+05.9	0.0	NON-PERFORM IN FIELD (OFFSET)	C-02
TEMPLE AVE	R-38	MH 4	MH 5	3+07.9	0.0	SUBMERGED LATERAL (EMPTY LOT)	C-02
MORRIS HILLS PWKY	R-40	MH 1	MH 2	0+13.5	19.0	CIPP	C-03
MORRIS HILLS PWKY	R-41	MH 1	MH 2	0+19.7	24.5	CIPP	C-03
MORRIS HILLS PWKY	R-42	MH 1	MH 2	0+40.8	24.5	CIPP	C-03
MORRIS HILLS PWKY	R-43	MH 1	MH 2	0+67.3	25.0	CIPP	C-03
MORRIS HILLS PWKY	R-44	MH 1	MH 2	0+87.1	25.0	CIPP	C-03
MORRIS HILLS PWKY	R-45	MH 1	MH 2	1+19.2	25.0	CIPP	C-03
MORRIS HILLS PWKY	R-48	MH 1	MH 2	1+63.1	0.0	NON-PERFORM IN FIELD (TURN IN PIPE)	C-03
MORRIS HILLS PWKY	R-49	MH 1	MH 2	1+72.1	25.0	CIPP	C-03
MORRIS HILLS PWKY	R-50	MH 1	MH 2	2+05.9	25.0	CIPP	C-03
MORRIS HILLS PWKY	R-52	MH 1	MH 2	2+53.5	21.0	CIPP	C-03
MORRIS HILLS PWKY	R-53	MH 1	MH 2	2+58.4	0.0	NON-PERFORM IN FIELD (TURN IN PIPE)	C-03
MORRIS HILLS PWKY	R-54	MH 1	MH 2	2+71.5	0.0	NON-PERFORM IN FIELD (OFFSET)	C-03

*CLEANOUTS MAY NOT BE ACCESSIBLE. LATERAL LINING SHALL BE LAUNCHED FROM THE MAIN SEWER LINE. CONTRACTOR TO VERIFY LATERAL LENGTHS. LATERAL LINING LENGTHS ARE ESTIMATED BASED ON CCTV SURVEY.

PROJECT ISSUE DATE

DATE: 05/26/2021

AS-BUILT

DATE: 01/31/2023

CLIENT: RACER TRUST

NO.	DATE	REVISION	INT.

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE

DESIGNED BY: CSY
CHECKED BY: MLH & REB
DRAWN BY: ZKL
FILE NO.: 33456.75178
DATE: 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

PROJECT: SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS: GENESEE TOWNSHIP, MICHIGAN

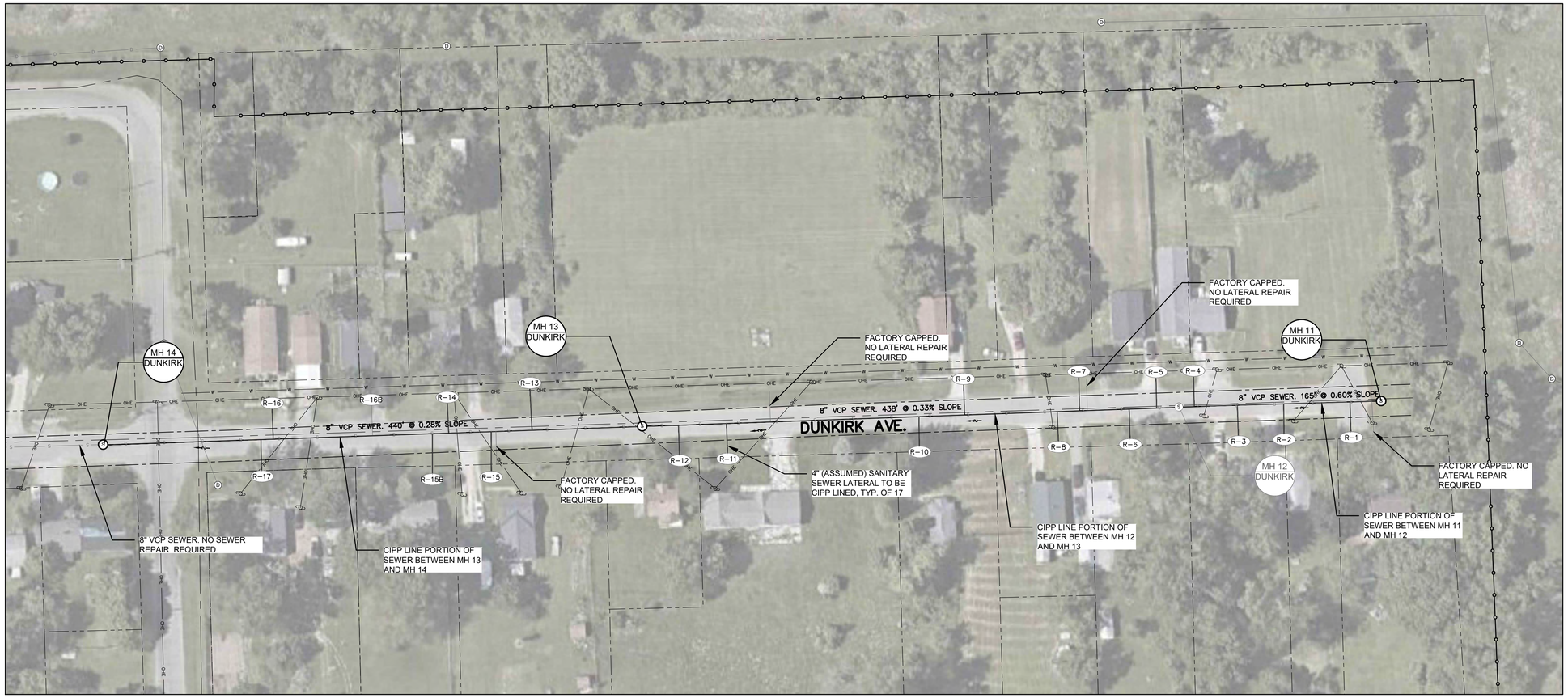
SHEET DESCRIPTION: REHABILITATION TABLES AND NOTES
DRAWING LOCATION: 75178-RACER TRUST

G-04

\\SYRACUSE\SVR\PROJECTS\RACER-TRUST..15388\75178.COLDWATER-2020\CONSTRUCTION\AS BUILTS\SHEETS\75178_1004.DWG

SAVED: 1/31/23 2:29 AM

NAD 83



NOTES:

1. CONTRACTOR SHALL VERIFY THE INTERNAL CONFIGURATION AND GENERAL CONDITION ASSOCIATED WITH EACH MANHOLE OR SEWER STRUCTURE SCHEDULED FOR REHABILITATION. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ADDRESS ANY INSTALLATION REQUIREMENTS AND TO PROVIDE THE APPROPRIATE MATERIALS, FLOW CONTROL, AND EQUIPMENT NECESSARY TO COMPLETE THE REQUIRED WORK.
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PROJECT ISSUE DATE

DATE: 05/26/2021

AS-BUILT

DATE: 01/31/2023

CLIENT
RACER TRUST

NO.	DATE	REVISION	INT.

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE

DESIGNED BY CSY
CHECKED BY MLH & REB
DRAWN BY ZKL
FILE NO. 33456.75178
DATE 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

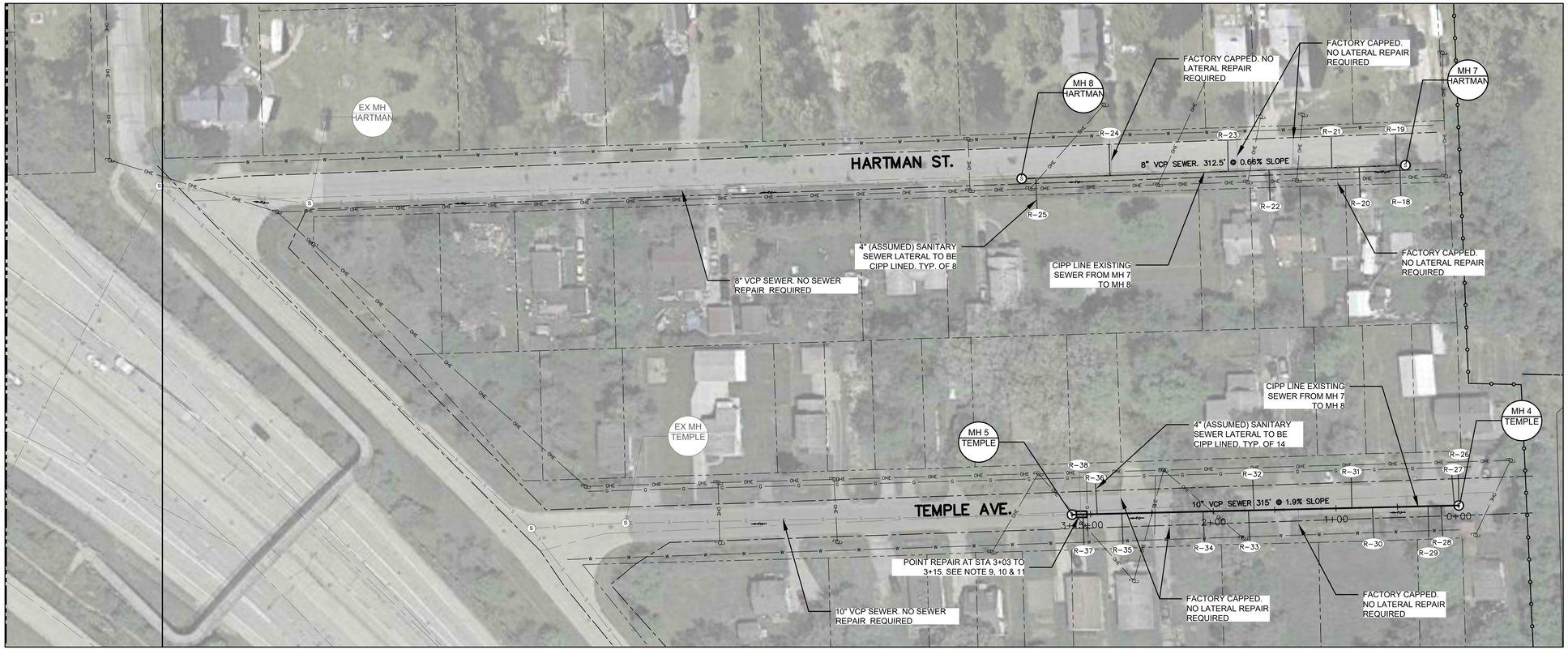
PROJECT
SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS
GENESEE TOWNSHIP, MICHIGAN

SHEET DESCRIPTION
PLAN - DUNKIRK AVENUE
DRAWING LOCATION
75178-RACER TRUST

C-01

I:\SYRACUSES\VR\PROJECTS\RACER-TRUST-15388\75178.COLDWATER-2020\CONSTRUCTION\AS BUILTS\SHEETS\75178_110.DWG

NAD 83



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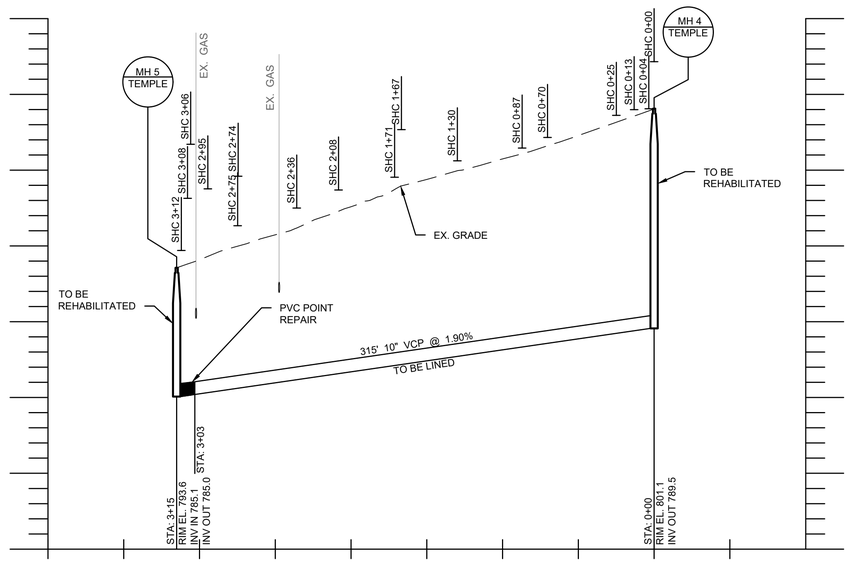
9. ALL POINT REPAIRS SHALL BE COMPLETED PRIOR TO CIPP LINING OF SEWER MAIN. CONTRACTOR SHALL REPLACE THE EXISTING PAVEMENT IN ACCORDANCE WITH THE DETAIL ON SHEET C-04 AND LOCAL REQUIREMENTS FOR ALL CONSTRUCTION ACTIVITIES THAT DISTURB THE BASE AND SUB-BASE OF THE EXISTING ROADWAY.
10. CONTRACTOR SHALL BE AWARE OF GAS LINE IN AREA OF POINT REPAIR AND SHOULD ADEQUATELY SUPPORT DURING EXCAVATION.
11. CONTRACTOR SHALL REFER TO MICIGHAN STATE CONTRACTOR'S DIRECTORY TO OVERHEAD POWER LINE SAFETY INFORMATION PRIOR TO ANY WORK THAT MAY BE IMPACTED BY OVERHEAD POWERLINES IN THE AREA.



PROFILE: MH 4- TEMPLE TO MH 5- TEMPLE

HORZ: 1" = 50'
VERT: 1" = 5'

PROJECT ISSUE DATE

DATE: 05/26/2021

AS-BUILT

DATE: 01/31/2023

CLIENT
RACER TRUST

NO.	DATE	REVISION	INT.

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE

DESIGNED BY CSY
CHECKED BY MLH & REB
DRAWN BY ZKL
FILE NO. 33456.75178
DATE 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

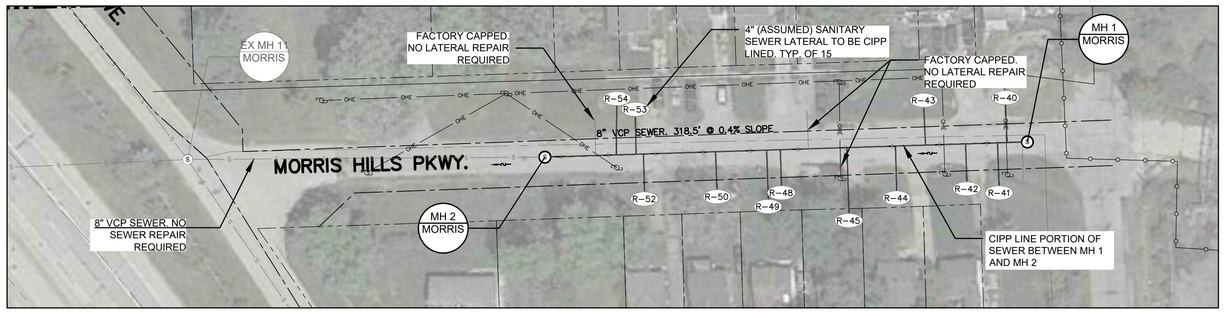
RAMBOLL

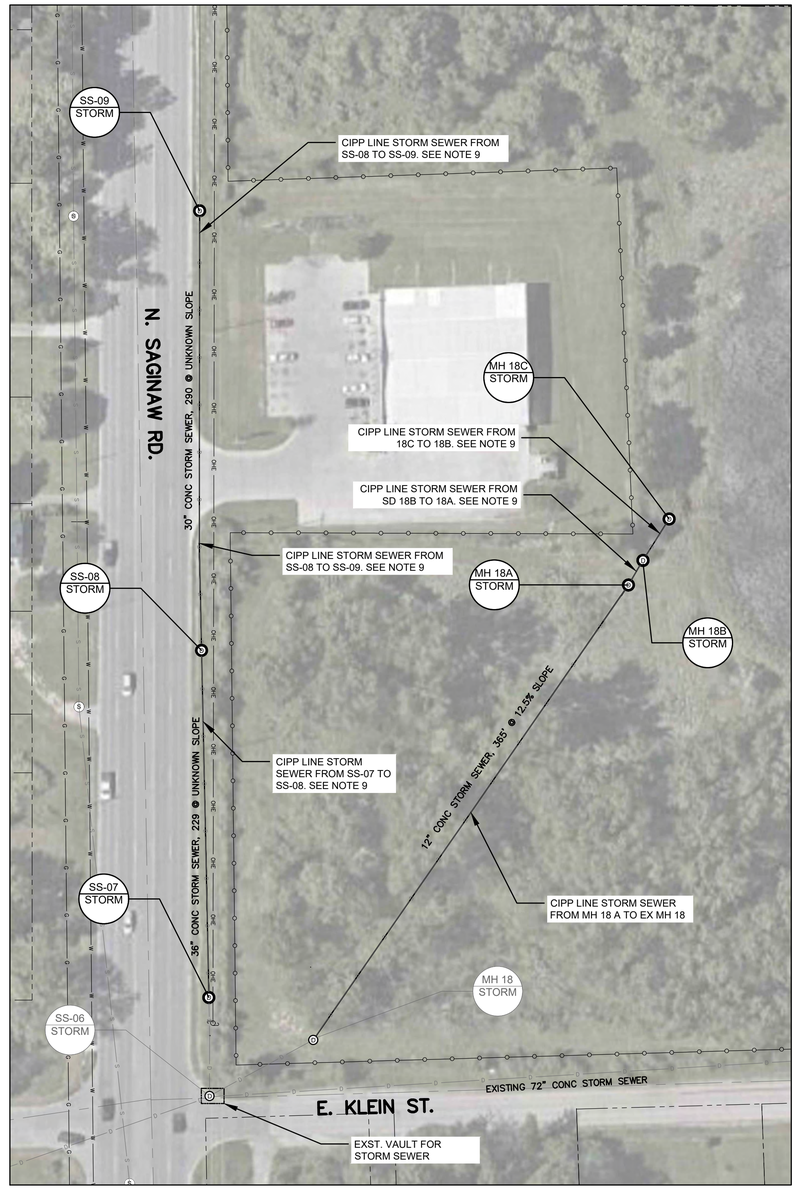
PROJECT
SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS
GENESEE TOWNSHIP, MICHIGAN

SHEET DESCRIPTION
PLAN AND PROFILE - HARTMAN STREET & TEMPLE AVENUE
DRAWING LOCATION
75178-RACER TRUST

C-02

NAD 83





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9. CONTRACTOR TO CONFIRM STORM SEWER PIPE SIZE, MATERIAL, AND SLOPE PRIOR TO LINING.

PROJECT
ISSUE DATE

DATE: 05/26/2021

AS-BUILT

DATE: 01/31/2023

CLIENT
RACER TRUST

NO.	DATE	REVISION	INT.

DESIGNER / PROFESSIONAL ENGINEER RESPONSIBLE

DESIGNED BY CSY
CHECKED BY MLH & REB
DRAWN BY ZKL
FILE NO. 33456.75178
DATE 05/26/2021

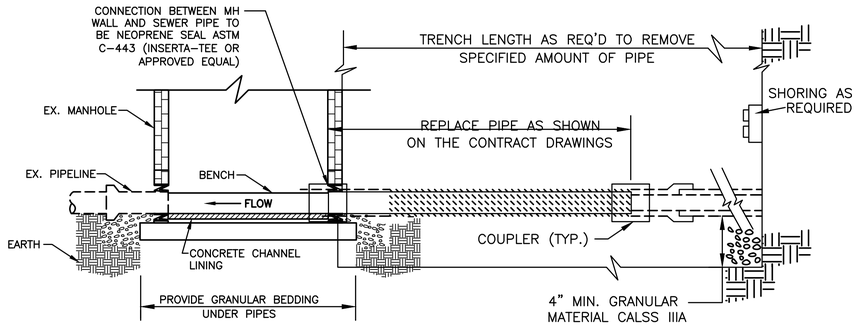
RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT
SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS
GENESEE TOWNSHIP, MICHIGAN

SHEET DESCRIPTION
PLAN - MORRIS HILLS PKWY & STORM SEWER REHABILITATION AREA
DRAWING LOCATION
75178-RACER TRUST

C-03

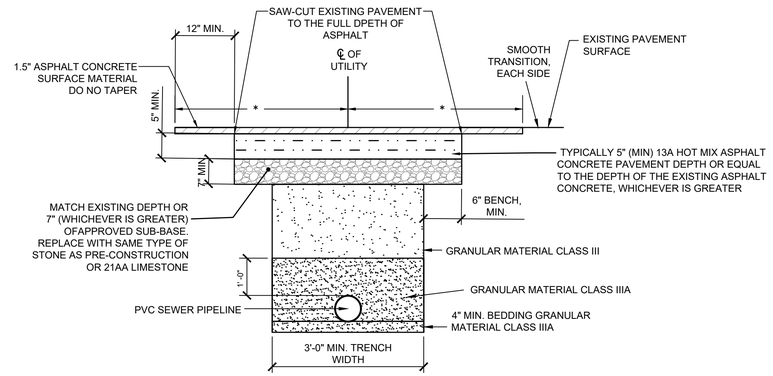


NOTE

1. SAWCUT PIPE AT THE BEGINNING & END OF THE SPECIFIED POINT REPAIR, UNLESS PIPE BELL CORRESPONDS WITH LOCATION.
2. OFFSET PIPE JOINTS WILL NOT BE PERMITTED.
3. NEW PIPE IN MANHOLE CONNECTION TO BE HELD IN PLACE WITH GASKET AND FULLY EMBEDDED IN NON-SHRINK GROUT TO PROVIDE A WATERTIGHT SEAL.
4. FLEX GASKET TO CONSIST OF PRESS WEDGE TYPE. INVERT CHANNEL TO BE SHAPED TO PROVIDE A SMOOTH FLOW LINE THROUGH THE MANHOLE STRUCTURE.
5. BEDDING SHALL BE VIRGIN MATERIAL ONLY.
6. AGGREGATE SUPPLIER SHALL BE FROM MDOT'S PREQUALIFIED LIST ONLY.

POINT REPAIR AND MANHOLE CONNECTION DETAIL

NOT TO SCALE



NOTE

1. BEDDING SHALL BE VIRGIN MATERIAL ONLY.
2. CONTRACTOR SHALL PROVIDE BACKFILL AND EMBEDMENT PER MDOT STANDARDS SPECIFICATIONS FOR CONSTRUCTION.
3. AGGREGATE SUPPLIER SHALL BE FROM MDOT'S PREQUALIFIED LIST ONLY.

PAVEMENT REPLACEMENT FOR PIPE TRENCH

NOT TO SCALE

PROJECT ISSUE DATE

DATE: 05/26/2021

AS-BUILT

DATE: 01/31/2023

CLIENT: RACER TRUST

NO.	DATE	REVISION	INT.

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CHECKED BY: MLH & REB
DRAWN BY: ZKL
FILE NO.: 33456.75178
DATE: 05/26/2021

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: SEWER REHABILITATION WEST OF COLDWATER ROAD SITE
ADDRESS: GENESEE TOWNSHIP, MICHIGAN

SHEET DESCRIPTION: CIVIL DETAILS
DRAWING LOCATION: 75178-RACER TRUST

C-04

APPENDIX C
LINER TEST RESULTS

OBG

SUBMITTAL REVIEW COMMENT SHEET

Owner	RACER Trust
Job Name	Sewer Rehab at Coldwater Road Site
Job Number	75178
Contract No.	11030-2021-01
Submittal No.	02732-03
Description	CIPP Liner Test Results
Specification Section	02732
Date	6/30/2022

☐ **REVIEWED**
☑ **REVIEWED AS NOTED (Submit Final Copy for File)**
☐ **RESUBMIT**
☐ **REJECTED**

Reviewed solely for general conformance with the project requirements indicated in the Contract Documents. This review does not relieve the Contractor from responsibility for errors or omissions in design for which the Contractor is responsible for and for safe and successful construction of the work. This review does not consider the means, methods, techniques, sequences, and operations of construction, or safety precautions or program incidental thereto, which are the sole responsibility of the Contractor.

By: Z.L. Date: 6/30/2022

Comments

1. Test results for the following alignments have been reviewed and accepted:
   a. Dunkirk MH 11 to MH 12
   b. Dunkirk MH 12 to MH 13
   c. Dunkirk MH 13 to MH 14
   d. Hartman MH 7 to MH 8
   e. Temple MH 4 to MH 5
   f. Morris Hills MH 1 to MH 2
   g. Saginaw Easement MH 18A to MH 18
   h. Saginaw Easement MH 18B to 18A

2. Thickness test results for the following alignment was less than the calculated thickness submitted by the Contractor:
   a. Saginaw Easement MH 18C to 18B

However, the measured thickness was determined to be acceptable based on the actual flexural modulus and flexural strength.

3. Test results for the following alignments were not provided for review:
   a. Saginaw Blvd. SS-09 to SS-08
   b. Saginaw Blvd. SS-08 to SS-07

HTS Pipe Consultants, Inc.
420 Pickering Street, Houston, TX 77091
www.htspipeconsultants.com

Phone 713-692-8373
Fax 713-692-8502
Toll Free 1-800-692-TEST

June 14, 2022

HTS Report #:	**22-P-0323-01**

Mr. Josh Alley
Inliner Solutions
28529 Goddard Rd., Ste. 106
Romulus, MI 48174

Customer Project Name:	Racer
Customer Project #:	1133279
Date Sample Received:	6/07/22
Date Sample Tested:	6/10/22

ok

Eight (8) samples of cured-in-place pipe were delivered to HTS's laboratory for testing. The samples were tested in accordance with ASTM D790, Method I, Procedure A. A Support Span-to-Depth Ratio of 16 to 1 was used as specified in the test standard. Thickness measurements, flexural stress and flexural modulus of elasticity tests were performed on each sample. Five (5) specimens were cut and tested from each sample. The results summarized and reported below are averages of the five (5) specimens. A test report for each sample is attached.

ok

ok

SAMPLE ID	MANHOLE TO MANHOLE	MAXIMUM FLEXURAL FIBER STRESS, psi ASTM D 790	FLEXURAL MODULUS OF ELASTICITY, psi ASTM D 790
1, Dunkirk	11 to 12	5887	332,904
2, Dunkirk	12 to 13	6704	417,833
3, Dunkirk	13 to 14	6842	399,482
4, Hartman	7 to 8	6476	382,691
5, Temple	4 to 5	6027	393,101
6, Morris Hills	1 to 2	5543	341,836
7, Saginaw Ease	18A to 18	6464	432,004
8-9, Saginaw Ease	18A to 18B to 18C	6875	430,027

min should be 4,500 psi

min should be 250,000 psi

Saginaw Blvd SS-09-SS-08 missing

Saginaw Blvd SS-08-SS-07 missing

The following table contains the thickness measurements for each individual specimen tested.
Thickness not included in structural design is deducted (in): 0.000

ok

MEASUREMENT OF THICKNESS FOR CURED IN PLACE PIPE LINER ASTM D5813												
										Combined Total Average/Specimen		
Sample ID	**Manhole To Manhole**	**No. 1**	**No. 2**	**No. 3**	**No. 4**	**No. 5**	**No. 6**	**No. 7**	**No. 8**	**in**	**mm**	
1, Dunkirk	11 to 12	0.255	0.255	0.255	0.251	0.254	0.250	0.251	0.255	0.253	6.4	ok
2, Dunkirk	12 to 13	0.245	0.244	0.239	0.215	0.243	0.238	0.252	0.236	0.239	6.1	ok
3, Dunkirk	13 to 14	0.247	0.236	0.231	0.250	0.250	0.248	0.240	0.246	0.244	6.2	ok
4, Hartman	7 to 8	0.249	0.244	0.250	0.247	0.248	0.237	0.240	0.247	0.245	6.2	ok
5, Temple	4 to 5	0.262	0.255	0.248	0.254	0.275	0.247	0.242	0.247	0.254	6.4	ok
6, Morris Hills	1 to 2	0.250	0.245	0.250	0.246	0.251	0.249	0.242	0.252	0.248	6.3	ok
7, Saginaw Ease	18A to 18	0.342	0.334	0.336	0.283	0.296	0.294	0.287	0.288	0.308	7.8	ok
8-9, Saginaw Ease	18A to 18B to 18C	0.295	0.244	0.248	0.240	0.278	0.271	0.280	0.284	0.268	6.8	

Technician	E. Carrillo
Time	8 hrs.

18B to 18A min required thickness = 6.7 mm

18C to 18B min required thickness = 7.2 mm

Saginaw Blvd SS-09 to SS-08 missing

Saginaw Blvd SS-08 to SS-07 missing

Sincerely,

Rick Eastwood
Vice President

HTS Pipe Consultants

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-30)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.093 in/min
SAMPLE ID	# 1, DUNKIRK, MH: 11 TO 12

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.584	0.232	3.5
2	0.584	0.250	3.5
3	0.586	0.258	3.5
4	0.587	0.260	3.5
5	0.593	0.265	3.5

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0460	34.5	5767	322370
2	0.0468	40.1	5762	320807
3	0.0465	43.5	5855	340524
4	0.0429	45.8	6061	349054
5	0.0478	47.5	5990	331764
Mean	0.0460	42.3	5887	332904
Std. dev	0	5	134	12015
Minimum	0.0429	34.5	5762	320807
Maximum	0.0478	47.5	6061	349054

HTS Pipe Consultants

6/10/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-10)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.080 in/min
SAMPLE ID	# 2, MH: DUNKIRK 12 TO 13

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.581	0.194	3.0
2	0.574	0.208	3.0
3	0.594	0.211	3.0
4	0.593	0.215	3.0
5	0.593	0.215	3.0

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0475	32.9	6771	459721
2	0.0497	35.8	6479	398942
3	0.0405	40.2	6841	414979
4	0.0454	41.9	6883	397242
5	0.0468	39.9	6547	418279
Mean	0.0460	38.1	6704	417833
Std. dev	0	4	181	25218
Minimum	0.0405	32.9	6479	397242
Maximum	0.0497	41.9	6883	459721

HTS Pipe Consultants

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-30)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.093 in/min
SAMPLE ID	# 3, MH: DUNKIRK 13 TO 14

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.575	0.235	3.5
2	0.587	0.245	3.5
3	0.570	0.235	3.5
4	0.588	0.243	3.5
5	0.578	0.250	3.5

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0468	46.8	7738	412595
2	0.0500	48.7	7257	393508
3	0.0420	39.0	6497	399822
4	0.0434	43.4	6569	397161
5	0.0467	42.3	6151	394321
Mean	0.0458	44.0	6842	399482
Std. dev	0	4	642	7742
Minimum	0.0420	39.0	6151	393508
Maximum	0.0500	48.7	7738	412595

HTS Pipe Consultants

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-30)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.093 in/min
SAMPLE ID	# 4, MH: HARTMAN 7 TO 8

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.570	0.235	3.5
2	0.584	0.238	3.5
3	0.574	0.235	3.5
4	0.582	0.244	3.5
5	0.573	0.251	3.5

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0466	37.6	6270	367577
2	0.0474	43.7	6939	390381
3	0.0452	37.5	6213	375740
4	0.0466	43.9	6646	390831
5	0.0481	43.4	6314	388927
Mean	0.0468	41.2	6476	382691
Std. dev	0	3	309	10501
Minimum	0.0452	37.5	6213	367577
Maximum	0.0481	43.9	6939	390831

HTS Pipe Consultants

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-10)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.107 in/min
SAMPLE ID	# 5, MH: TEMPLE 4 TO 5

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.551	0.250	4.0
2	0.567	0.258	4.0
3	0.558	0.268	4.0
4	0.570	0.270	4.0
5	0.568	0.270	4.0

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0490	32.5	5667	370167
2	0.0474	37.9	6032	395101
3	0.0500	41.1	6154	394942
4	0.0444	42.9	6198	403846
5	0.0489	42.0	6082	401450
Mean	0.0479	39.3	6027	393101
Std. dev	0	4	211	13403
Minimum	0.0444	32.5	5667	370167
Maximum	0.0500	42.9	6198	403846

HTS Pipe Consultants

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-30)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.093 in/min
SAMPLE ID	# 6, MH: MORRIS HILLS 1 TO 2

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.556	0.228	3.5
2	0.574	0.232	3.5
3	0.570	0.240	3.5
4	0.574	0.235	3.5
5	0.580	0.254	3.5

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0490	30.0	5448	349270
2	0.0438	32.1	5455	332944
3	0.0436	36.9	5902	362509
4	0.0462	32.2	5338	315232
5	0.0479	39.7	5574	349226
Mean	0.0461	34.2	5543	341836
Std. dev	0	4	217	18194
Minimum	0.0436	30.0	5338	315232
Maximum	0.0490	39.7	5902	362509

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-10)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.133 in/min
SAMPLE ID	# 7, MH: SAGINAW EASE 18A TO 18

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.577	0.313	5.0
2	0.579	0.320	5.0
3	0.577	0.331	5.0
4	0.578	0.333	5.0
5	0.572	0.340	5.0

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0481	50.1	6652	429187
2	0.0500	52.4	6630	454676
3	0.0286	52.3	6199	424292
4	0.0470	56.2	6574	431669
5	0.0493	55.2	6264	420195
Mean	0.0446	53.2	6464	432004
Std. dev	0	2	215	13425
Minimum	0.0286	50.1	6199	420195
Maximum	0.0500	56.2	6652	454676

HTS Pipe Consultants

6/9/2022

FLEXURAL PROPERTIES OF PLASTICS
ASTM D790
3 POINT BEND

INSTRON
BLUEHILL V 4.25 (34TM-10)

OPERATOR	DAVID
TEMPERATURE	71 F
HUMIDITY	50 %
RATE	0.107 in/min
SAMPLE ID	# 8,9, MH: SAGINAW EASE 18A TO 18B TO 18C

	WIDTH [in]	THICKNESS [in]	SUPPORT SPAN [in]
1	0.581	0.263	4.0
2	0.580	0.260	4.0
3	0.563	0.261	4.0
4	0.579	0.268	4.0
5	0.583	0.273	4.0

	STRAIN @ MAX [in/in]	MAXIMUM LOAD [lbf]	FLEXURAL STRENGTH [psi]	FLEXURAL MODULUS [psi]
1	0.0500	43.0	6423	446529
2	0.0477	45.6	6973	416045
3	0.0445	40.5	6340	395201
4	0.0489	50.3	7251	439714
5	0.0471	53.5	7386	452648
Mean	0.0476	46.6	6875	430027
Std. dev	0	5	475	23907
Minimum	0.0445	40.5	6340	395201
Maximum	0.0500	53.5	7386	452648

CIPP SAMPLE TRANSMITTAL

Inliner Solutions
28529 Goddard Rd,Suite106
Romulus, MI 48174
Telephone: 734.955.2508
Fax: 734.955.2504

DATE: 6/1/2022	JOB NO: Racer 1133279
ATTENTION: **Larry McMichael, 713.692.8373**	
SUBJECT: CIPP SAMPLE TESTING	

22-P-323
6/7/22

To: HTS, Inc.
416 Pickering Street
Houston, TX 77091
713.692.8373

WE ARE SENDING YOU THE FOLLOWING SAMPLES:

[X] **Restrained End** — **Restrained End Diameter:**

[ ] **Plate** — **Plate Size:**

[ ] **Other (specify (i.e. unrestrained, middle manhole cut-out)):**

	ID	DESCRIPTION
1	#1	8" x 168' Dunkirk 11 > 12
2	#2	8" x 442' Dunkirk 12 > 13
3	#3	8" x 440' Dunkirk 13 > 14
4	#4	8" x 316' Hartman 7 > 8
5	#5	10" x 317' Temple 4 > 5
6	#6	8" x 320' Morris Hills 1 > 2
7	#7	12" x 389' Saginaw Ease. 18A > 18
8	#8,9	12" x 55' Saginaw Ease. 18A > 18B > 18C

PLEASE COMPLETE THE FOLLOWING TESTING:

- [X] **Thickness Measurement Per ASTM D 5813**
- [X] **Flexural Modulus of Elasticity Per ASTM D 790**
- [X] **Flexural Strength Per ASTM D 790**
- [ ] **Tensile Strength Per ASTM D 638**
- [ ] **Delamination Per ASTM D903 with Exceptions as Noted in ASTM F1216 and ASTM F1743**
- [ ] **Other (specify):**

REMARKS:

SIGNED: _____
Josh Alley

APPENDIX D
ANALYTICAL LABORATORY REPORTS

Analytical Laboratory Report

Report ID: S09100.01(01)
Generated on 11/27/2019

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S09100.01-S09100.41
Project: RACER Coldwater Rd.
Collected Date(s): 11/04/2019 - 11/05/2019
Submitted Date/Time: 11/06/2019 15:30
Sampled by: Kevin Schneider
P.O. #: PO

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTM D7968-17M	
ASTMD7979-17M	ASTM Method D7979 - 17 Modified (Isotopic Dilution)
SM2540B	Standard Method 2540 B 2011

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	474511-07-4
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Sample Summary (41 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S09100.01	SBP-37-N-0.5	Soil	11/04/19 13:10
S09100.02	SBP-37-N-1	Soil	11/04/19 13:12
S09100.03	SBP-37-N-3	Soil	11/04/19 13:27
S09100.04	SBP-37A-1	Soil	11/04/19 13:41
S09100.05	SBP-37A-3	Soil	11/04/19 14:00
S09100.06	SBP-37-S-0.5	Soil	11/04/19 14:18
S09100.07	SBP-37-S-1	Soil	11/04/19 14:21
S09100.08	SBP-37-S-3	Soil	11/04/19 14:41
S09100.09	SD-9-E-0.5	Soil	11/04/19 15:12
S09100.10	SD-9-E-3	Soil	11/04/19 15:22
S09100.11	SD-9A-3	Soil	11/04/19 15:38
S09100.12	Field Blank-110519	Water	11/05/19 08:20
S09100.13	SAN-1	Wastewater	11/05/19 09:55
S09100.14	SAN-2	Wastewater	11/05/19 10:10
S09100.15	MH-18	Liquid	11/05/19 10:35
S09100.16	MH-17A	Liquid	11/05/19 11:04
S09100.17	SAN-3	Wastewater	11/05/19 11:30
S09100.18	SAN-4	Wastewater	11/05/19 11:55
S09100.19	SAN-5	Wastewater	11/05/19 12:25
S09100.20	SS-03	Liquid	11/05/19 14:45
S09100.21	SS-DUP-1	Liquid	11/05/19 00:01
S09100.22	SD-DUP-1	Soil	11/05/19 00:01
S09100.23	SD-9-N-0.5	Soil	11/05/19 09:40
S09100.24	SD-9-N-3	Soil	11/05/19 10:15
S09100.25	SD-9-W-0.5	Soil	11/05/19 10:26
S09100.26	SD-9-W-3	Soil	11/05/19 10:54
S09100.27	SD-7A-3	Soil	11/05/19 11:22
S09100.28	SD-7-SE-0.5	Soil	11/05/19 11:35
S09100.29	SD-7-SE-3	Soil	11/05/19 12:10
S09100.30	SD-7-NW-0.5	Soil	11/05/19 12:22
S09100.31	SD-7-NW-3	Soil	11/05/19 12:46
S09100.32	SBP-32-N-0.5	Soil	11/05/19 14:34
S09100.33	SBP-32-N-1	Soil	11/05/19 14:40
S09100.34	SBP-32-N-3	Soil	11/05/19 14:50
S09100.35	SBP-32A-1	Soil	11/05/19 15:00
S09100.36	SBP-32A-3	Soil	11/05/19 15:11
S09100.37	SBP-32-S-0.5	Soil	11/05/19 15:21
S09100.38	SBP-32-S-1	Soil	11/05/19 15:26
S09100.39	SBP-32-S-3	Soil	11/05/19 15:42
S09100.40	SBP-DUP-8	Soil	11/05/19 00:01
S09100.41	Equipment Blank-11	Water	11/05/19 16:00

Lab Sample ID: S09100.12
Sample Tag: Field Blank-110519
Collected Date/Time: 11/05/2019 08:20
Matrix: Water
COC Reference: 116015

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/20/19 22:32, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2	375-22-4	
PFPeA*	Not detected	10		ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2	757124-72-4	
PFHxA*	Not detected	10		ng/L	2	307-24-4	
PFBS*	Not detected	10		ng/L	2	375-73-5	
PFHpA*	Not detected	10		ng/L	2	375-85-9	
PFPeS*	Not detected	10		ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2	27619-97-2	
PFOA*	Not detected	10		ng/L	2	335-67-1	
PFHxS*	Not detected	10		ng/L	2	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2	39108-34-4	
PFHpS*	Not detected	10		ng/L	2	375-92-8	
PFDA*	Not detected	10		ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2	2991-50-6	
PFOS*	Not detected	10		ng/L	2	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2	2058-94-8	
PFNS*	Not detected	10		ng/L	2	474511-07-4	
PFDoDA*	Not detected	10		ng/L	2	307-55-1	
PFDS*	Not detected	10		ng/L	2	335-77-3	
PFTrDA*	Not detected	10		ng/L	2	72629-94-8	
FOSA*	Not detected	10		ng/L	2	754-91-6	
PFTeDA*	Not detected	10		ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2	756426-58-1	
ADONA*	Not detected	10		ng/L	2	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S09100.13
Sample Tag: SAN-1
Collected Date/Time: 11/05/2019 09:55
Matrix: Wastewater
COC Reference: 125042

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/20/19 22:53, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.98	375-22-4	
PFPeA*	Not detected	9.9		ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.98	757124-72-4	
PFHxA*	Not detected	9.9		ng/L	1.98	307-24-4	
PFBS*	Not detected	9.9		ng/L	1.98	375-73-5	
PFHpA*	Not detected	9.9		ng/L	1.98	375-85-9	
PFPeS*	Not detected	9.9		ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.98	27619-97-2	
PFOA*	Not detected	9.9		ng/L	1.98	335-67-1	
PFHxS*	Not detected	9.9		ng/L	1.98	355-46-4	
PFHxS-LN*	Not detected	9.9		ng/L	1.98	355-46-4-LN	
PFHxS-BR*	Not detected	9.9		ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.98	39108-34-4	
PFHpS*	Not detected	9.9		ng/L	1.98	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.98	2991-50-6	
PFOS*	55	9.9		ng/L	1.98	1763-23-1	
PFOS-LN*	18	9.9		ng/L	1.98	1763-23-1-LN	
PFOS-BR*	36	9.9		ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.98	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.98	474511-07-4	
PFDoDA*	Not detected	9.9		ng/L	1.98	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.98	335-77-3	
PFTrDA*	Not detected	9.9		ng/L	1.98	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.98	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.98	376-06-7	
11Cl-PF3OUdS*	Not detected	9.9		ng/L	1.98	763051-92-9	
9Cl-PF3ONS*	Not detected	9.9		ng/L	1.98	756426-58-1	
ADONA*	Not detected	9.9		ng/L	1.98	919005-14-4	
HFPO-DA*	Not detected	9.9		ng/L	1.98	13252-13-6	

Lab Sample ID: S09100.14
Sample Tag: SAN-2
Collected Date/Time: 11/05/2019 10:10
Matrix: Wastewater
COC Reference: 125042

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/20/19 23:14, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.98	375-22-4	
PFPeA*	Not detected	9.9		ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.98	757124-72-4	I
PFHxA*	Not detected	9.9		ng/L	1.98	307-24-4	
PFBS*	Not detected	9.9		ng/L	1.98	375-73-5	
PFHpA*	Not detected	9.9		ng/L	1.98	375-85-9	
PFPeS*	Not detected	9.9		ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.98	27619-97-2	
PFOA*	Not detected	9.9		ng/L	1.98	335-67-1	
PFHxS*	Not detected	9.9		ng/L	1.98	355-46-4	
PFHxS-LN*	Not detected	9.9		ng/L	1.98	355-46-4-LN	
PFHxS-BR*	Not detected	9.9		ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.98	39108-34-4	
PFHpS*	Not detected	9.9		ng/L	1.98	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.98	2991-50-6	I
PFOS*	37	9.9		ng/L	1.98	1763-23-1	
PFOS-LN*	11	9.9		ng/L	1.98	1763-23-1-LN	
PFOS-BR*	23	9.9		ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.98	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.98	474511-07-4	
PFDoDA*	Not detected	9.9		ng/L	1.98	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.98	335-77-3	
PFTrDA*	Not detected	9.9		ng/L	1.98	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.98	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.98	376-06-7	
11Cl-PF3OUdS*	Not detected	9.9		ng/L	1.98	763051-92-9	
9Cl-PF3ONS*	Not detected	9.9		ng/L	1.98	756426-58-1	
ADONA*	Not detected	9.9		ng/L	1.98	919005-14-4	
HFPO-DA*	Not detected	9.9		ng/L	1.98	13252-13-6	

I-Matrix interference with internal standard

Lab Sample ID: S09100.15
Sample Tag: MH-18
Collected Date/Time: 11/05/2019 10:35
Matrix: Liquid
COC Reference: 125042

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/20/19 23:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2	375-22-4	
PFPeA*	Not detected	10		ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2	757124-72-4	
PFHxA*	Not detected	10		ng/L	2	307-24-4	
PFBS*	Not detected	10		ng/L	2	375-73-5	
PFHpA*	Not detected	10		ng/L	2	375-85-9	
PFPeS*	Not detected	10		ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2	27619-97-2	
PFOA*	Not detected	10		ng/L	2	335-67-1	
PFHxS*	15	10		ng/L	2	355-46-4	
PFHxS-LN*	12	10		ng/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2	39108-34-4	
PFHpS*	Not detected	10		ng/L	2	375-92-8	
PFDA*	Not detected	10		ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2	2991-50-6	
PFOS*	210	10		ng/L	2	1763-23-1	
PFOS-LN*	110	10		ng/L	2	1763-23-1-LN	
PFOS-BR*	91	10		ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2	2058-94-8	
PFNS*	Not detected	10		ng/L	2	474511-07-4	
PFDoDA*	Not detected	10		ng/L	2	307-55-1	
PFDS*	Not detected	10		ng/L	2	335-77-3	
PFTrDA*	Not detected	10		ng/L	2	72629-94-8	
FOSA*	Not detected	10		ng/L	2	754-91-6	
PFTeDA*	Not detected	10		ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2	756426-58-1	
ADONA*	Not detected	10		ng/L	2	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2	13252-13-6	

Lab Sample ID: S09100.17
Sample Tag: SAN-3
Collected Date/Time: 11/05/2019 11:30
Matrix: Wastewater
COC Reference: 125042

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/21/19 00:18, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.94	375-22-4	
PFPeA*	Not detected	9.7		ng/L	1.94	2706-90-3	
4:2 FTSA*	Not detected	9.7		ng/L	1.94	757124-72-4	
PFHxA*	Not detected	9.7		ng/L	1.94	307-24-4	
PFBS*	Not detected	9.7		ng/L	1.94	375-73-5	
PFHpA*	Not detected	9.7		ng/L	1.94	375-85-9	
PFPeS*	Not detected	9.7		ng/L	1.94	2706-91-4	
6:2 FTSA*	Not detected	9.7		ng/L	1.94	27619-97-2	
PFOA*	Not detected	9.7		ng/L	1.94	335-67-1	
PFHxS*	40	9.7		ng/L	1.94	355-46-4	
PFHxS-LN*	33	9.7		ng/L	1.94	355-46-4-LN	
PFHxS-BR*	Not detected	9.7		ng/L	1.94	355-46-4-BR	
PFNA*	Not detected	9.7		ng/L	1.94	375-95-1	
8:2 FTSA*	Not detected	9.7		ng/L	1.94	39108-34-4	
PFHpS*	Not detected	9.7		ng/L	1.94	375-92-8	
PFDA*	Not detected	9.7		ng/L	1.94	335-76-2	
N-MeFOSAA*	Not detected	9.7		ng/L	1.94	2355-31-9	
EtFOSAA*	Not detected	9.7		ng/L	1.94	2991-50-6	
PFOS*	110	9.7		ng/L	1.94	1763-23-1	
PFOS-LN*	21	9.7		ng/L	1.94	1763-23-1-LN	
PFOS-BR*	85	9.7		ng/L	1.94	1763-23-1-BR	
PFUnDA*	Not detected	9.7		ng/L	1.94	2058-94-8	
PFNS*	Not detected	9.7		ng/L	1.94	474511-07-4	
PFDoDA*	Not detected	9.7		ng/L	1.94	307-55-1	
PFDS*	Not detected	9.7		ng/L	1.94	335-77-3	
PFTrDA*	Not detected	9.7		ng/L	1.94	72629-94-8	
FOSA*	Not detected	9.7		ng/L	1.94	754-91-6	
PFTeDA*	Not detected	9.7		ng/L	1.94	376-06-7	
11Cl-PF3OUdS*	Not detected	9.7		ng/L	1.94	763051-92-9	
9Cl-PF3ONS*	Not detected	9.7		ng/L	1.94	756426-58-1	
ADONA*	Not detected	9.7		ng/L	1.94	919005-14-4	
HFPO-DA*	Not detected	9.7		ng/L	1.94	13252-13-6	

Lab Sample ID: S09100.18
Sample Tag: SAN-4
Collected Date/Time: 11/05/2019 11:55
Matrix: Wastewater
COC Reference: 125042

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/21/19 00:39, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2.02	375-22-4	
PFPeA*	Not detected	10		ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.02	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.02	307-24-4	
PFBS*	Not detected	10		ng/L	2.02	375-73-5	
PFHpA*	Not detected	10		ng/L	2.02	375-85-9	
PFPeS*	Not detected	10		ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.02	27619-97-2	
PFOA*	Not detected	10		ng/L	2.02	335-67-1	
PFHxS*	Not detected	10		ng/L	2.02	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.02	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.02	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.02	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.02	375-92-8	
PFDA*	Not detected	10		ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.02	2991-50-6	
PFOS*	61	10		ng/L	2.02	1763-23-1	
PFOS-LN*	17	10		ng/L	2.02	1763-23-1-LN	
PFOS-BR*	33	10		ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.02	2058-94-8	
PFNS*	Not detected	10		ng/L	2.02	474511-07-4	
PFDoDA*	Not detected	10		ng/L	2.02	307-55-1	
PFDS*	Not detected	10		ng/L	2.02	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.02	72629-94-8	
FOSA*	Not detected	10		ng/L	2.02	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.02	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.02	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.02	756426-58-1	
ADONA*	Not detected	10		ng/L	2.02	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.02	13252-13-6	

Lab Sample ID: S09100.19
Sample Tag: SAN-5
Collected Date/Time: 11/05/2019 12:25
Matrix: Wastewater
COC Reference: 125042

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Organics

28 PFAs, Method: ASTMD7979-17M, Run Date: 11/21/19 01:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2	375-22-4	
PFPeA*	Not detected	10		ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2	757124-72-4	
PFHxA*	Not detected	10		ng/L	2	307-24-4	
PFBS*	Not detected	10		ng/L	2	375-73-5	
PFHpA*	Not detected	10		ng/L	2	375-85-9	
PFPeS*	Not detected	10		ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2	27619-97-2	
PFOA*	Not detected	10		ng/L	2	335-67-1	
PFHxS*	20	10		ng/L	2	355-46-4	
PFHxS-LN*	16	10		ng/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2	39108-34-4	
PFHpS*	Not detected	10		ng/L	2	375-92-8	
PFDA*	Not detected	10		ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2	2991-50-6	
PFOS*	170	10		ng/L	2	1763-23-1	
PFOS-LN*	69	10		ng/L	2	1763-23-1-LN	
PFOS-BR*	100	10		ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2	2058-94-8	
PFNS*	Not detected	10		ng/L	2	474511-07-4	
PFDoDA*	Not detected	10		ng/L	2	307-55-1	
PFDS*	Not detected	10		ng/L	2	335-77-3	
PFTrDA*	Not detected	10		ng/L	2	72629-94-8	
FOSA*	Not detected	10		ng/L	2	754-91-6	
PFTeDA*	Not detected	10		ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2	756426-58-1	
ADONA*	Not detected	10		ng/L	2	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S09100
Client: OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)
Project: RACER Coldwater Rd.
Submitted: 11/06/2019 15:30 Login User: MMC

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.5
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 4

116015

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere Part of Ramboll
ADDRESS: East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: clifford.yantz@OBG.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Erin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (7975)
09100.01	11/4/19	1310	SBP-37-N-0.5	S	4	4							X
.02		1317	SBP-37-N-1										X
.03		1327	SBP-37-N-3										X
.04		1341	SBP-37A-1										X
.05		1400	SBP-37A-3										X
.06		1418	SBP-37-S-0.5										X
.07		1421	SBP-37-S-1										X
.08		1441	SBP-37-S-3										X
.09		1512	SD-9-E-0.5										X
.10		1522	SD-9-E-3										X
.11		1538	SD-9A-3										X
.12	11/5/19	820	Field Blnk-110519	QC	1	1							X

		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	11/5/19	1605
RECEIVED BY: SIGNATURE/ORGANIZATION		11/5/19	16:05
RELINQUISHED BY: SIGNATURE/ORGANIZATION		11/6/19	15:30
RECEIVED BY: SIGNATURE/ORGANIZATION		11/6/19	1530

		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION			
RECEIVED BY: SIGNATURE/ORGANIZATION			

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.5

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 7 OF 4

125042

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien + Gere Part of Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-733-0211 FAX NO.:
E-MAIL ADDRESS: clifford.yantz@Ramboll.com
P.O. NO.:
QUOTE NO.:

INVOICE TO

CONTACT NAME:
☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (7979)	Special Instructions
09100.13	11/5/19	955	SAN-1	ww	3	3							X	Sanitary sewer sample
.14		1010	SAN-2	ww									X	Sanitary sewer sample
.15		1035	MH-18	L									X	
.16		1104	MH-17A	L									X	
.17		1130	SAN-3	ww									X	Sanitary sewer sample
.18		1155	SAN-4	ww									X	Sanitary sewer sample
.19		1225	SAN-5	ww									X	Sanitary sewer sample
.20		1445	SS-03	L									X	
.21	↓	—	SS-DUP-1	L	↓	↓							X	

KBS

		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	11/5/19	1605
RECEIVED BY: SIGNATURE/ORGANIZATION		11/5/19	16:01
RELINQUISHED BY: SIGNATURE/ORGANIZATION		11/6/19	15:30
RECEIVED BY: SIGNATURE/ORGANIZATION		11/6/19	1530

		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION			
RECEIVED BY: SIGNATURE/ORGANIZATION			

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.5

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 3 OF 4

116016

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere Part of Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 4[illegible]
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: clifford.yantz@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (7475)
09100.22	11/5/19	—	SD-DUP-1	S	4	4							X
.23		940	SD-9-N-0.5										X
.24		1015	SD-9-N-3										X
.25		1026	SD-9-W-0.5										X
.26		1054	SD-9-W-3										X
.27		1122	SD-7A-3										X
.28		1135	SD-7-SE-0.5										X
.29		1210	SD-7-SE-3										X
.30		1222	SD-7-NW-0.5										X
.31	↓	1246	SD-7-NW-3	↓	↓	↓							X
			KBS										

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 11/5/19	TIME 1605	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 11/5/19	TIME 1605	
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 11/6/19	TIME 1515	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 11/6/19	TIME 1530	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES:	TEMP. ON ARRIVAL 5.5
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 4 OF 4

116017

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME	Clifford Yantz
COMPANY	O'Brien & Gere Part of Ramboll
ADDRESS	2260 East Saginaw
CITY	East Lansing
STATE	MI
ZIP CODE	48823
PHONE NO.	313-333-0211
FAX NO.	
P.O. NO.	
E-MAIL ADDRESS	clifford.yantz@Ramboll.com
QUOTE NO.	

INVOICE TO

CONTACT NAME	
☒ SAME	
COMPANY	
ADDRESS	
CITY	
STATE	
ZIP CODE	
PHONE NO.	
E-MAIL ADDRESS	

PROJECT NO./NAME	RACER Coldwater RD
SAMPLER(S) - PLEASE PRINT/SIGN NAME	Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (7175)
09100.32	11/5/19	1434	SBP-32-N-0.5	S	4	4							X
.33		1440	SBP-32-N-1										X
.34		1450	SBP-32-N-3										X
.35		1500	SBP-32A-1										X
.36		1511	SBP-32A-3										X
.37		1521	SBP-32-S-0.5										X
.38		1526	SBP-32-S-1										X
.39		1542	SBP-32-S-3										X
.40		—	SBP-DUP-8										X
.41		1600	Equipment Blank-11	QC	3	3							X

1635

RELINQUISHED BY: SIGNATURE/ORGANIZATION	CB	☒ Sampler	DATE 11/5/19	TIME 1605
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 11/5/19	TIME 16:05
RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE 11/6/19	TIME 1513
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 11/6/19	TIME 1530

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL 5.5
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S12787.01(01)
Generated on 03/24/2020

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

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2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S12787.01-S12787.03, S12787.07-S12787.10
Project: RACER Coldwater Rd.
Collected Date(s): 03/17/2020 - 03/18/2020
Submitted Date/Time: 03/18/2020 13:40
Sampled by: Kevin Schneider
P.O. #: 11900504

Table of Contents

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Report all samples except .04-.06 per client

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S12787.01	SS-03	Liquid	03/17/20 14:52
S12787.02	SAN-06	Liquid	03/17/20 16:15
S12787.03	SAN-07	Liquid	03/18/20 09:35
S12787.07	Field Blank-031820	Liquid	03/18/20 11:45
S12787.08	SAN-10	Liquid	03/18/20 11:48
S12787.09	SAN-11	Liquid	03/18/20 12:11
S12787.10	SAN-12	Liquid	03/18/20 12:28

Analytical Laboratory Report

Lab Sample ID: S12787.02
Sample Tag: SAN-06
Collected Date/Time: 03/17/2020 16:15
Matrix: Liquid
COC Reference: 129296

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.1	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/19/20 00:49, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	21		ng/L	2.06	375-22-4	
PFPeA*	Not detected	10		ng/L	2.06	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.06	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.06	307-24-4	
PFBS*	Not detected	10		ng/L	2.06	375-73-5	
PFHpA*	Not detected	10		ng/L	2.06	375-85-9	
PFPeS*	Not detected	10		ng/L	2.06	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.06	27619-97-2	
PFOA*	Not detected	10		ng/L	2.06	335-67-1	
PFHxS*	Not detected	10		ng/L	2.06	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.06	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.06	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.06	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.06	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.06	375-92-8	
PFDA*	Not detected	10		ng/L	2.06	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.06	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.06	2991-50-6	
PFOS*	14	10		ng/L	2.06	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.06	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2.06	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.06	2058-94-8	
PFNS*	Not detected	10		ng/L	2.06	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2.06	307-55-1	
PFDS*	Not detected	10		ng/L	2.06	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.06	72629-94-8	
FOSA*	Not detected	10		ng/L	2.06	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.06	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.06	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.06	756426-58-1	
ADONA*	Not detected	10		ng/L	2.06	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.06	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12787.03
Sample Tag: SAN-07
Collected Date/Time: 03/18/2020 09:35
Matrix: Liquid
COC Reference: 129296

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.1	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/19/20 01:11, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	21		ng/L	2.1	375-22-4	
PFPeA*	Not detected	11		ng/L	2.1	2706-90-3	
4:2 FTSA*	Not detected	11		ng/L	2.1	757124-72-4	
PFHxA*	Not detected	11		ng/L	2.1	307-24-4	
PFBS*	Not detected	11		ng/L	2.1	375-73-5	
PFHpA*	Not detected	11		ng/L	2.1	375-85-9	
PFPeS*	Not detected	11		ng/L	2.1	2706-91-4	
6:2 FTSA*	Not detected	11		ng/L	2.1	27619-97-2	
PFOA*	Not detected	11		ng/L	2.1	335-67-1	
PFHxS*	Not detected	11		ng/L	2.1	355-46-4	
PFHxS-LN*	Not detected	11		ng/L	2.1	355-46-4-LN	
PFHxS-BR*	Not detected	11		ng/L	2.1	355-46-4-BR	
PFNA*	Not detected	11		ng/L	2.1	375-95-1	
8:2 FTSA*	Not detected	11		ng/L	2.1	39108-34-4	
PFHpS*	Not detected	11		ng/L	2.1	375-92-8	
PFDA*	Not detected	11		ng/L	2.1	335-76-2	
N-MeFOSAA*	Not detected	11		ng/L	2.1	2355-31-9	
EtFOSAA*	Not detected	11		ng/L	2.1	2991-50-6	
PFOS*	Not detected	11		ng/L	2.1	1763-23-1	
PFOS-LN*	Not detected	11		ng/L	2.1	1763-23-1-LN	
PFOS-BR*	Not detected	11		ng/L	2.1	1763-23-1-BR	
PFUnDA*	Not detected	11		ng/L	2.1	2058-94-8	
PFNS*	Not detected	11		ng/L	2.1	68259-12-1	
PFDoDA*	Not detected	11		ng/L	2.1	307-55-1	
PFDS*	Not detected	11		ng/L	2.1	335-77-3	
PFTrDA*	Not detected	11		ng/L	2.1	72629-94-8	
FOSA*	Not detected	11		ng/L	2.1	754-91-6	
PFTeDA*	Not detected	11		ng/L	2.1	376-06-7	
11Cl-PF3OUdS*	Not detected	11		ng/L	2.1	763051-92-9	
9Cl-PF3ONS*	Not detected	11		ng/L	2.1	756426-58-1	
ADONA*	Not detected	11		ng/L	2.1	919005-14-4	
HFPO-DA*	Not detected	11		ng/L	2.1	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12787.07
Sample Tag: Field Blank-031820
Collected Date/Time: 03/18/2020 11:45
Matrix: Liquid
COC Reference: 129296

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.1	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/19/20 22:57, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	21		ng/L	2.08	375-22-4	
PFPeA*	Not detected	10		ng/L	2.08	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.08	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.08	307-24-4	
PFBS*	Not detected	10		ng/L	2.08	375-73-5	
PFHpA*	Not detected	10		ng/L	2.08	375-85-9	
PFPeS*	Not detected	10		ng/L	2.08	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.08	27619-97-2	
PFOA*	Not detected	10		ng/L	2.08	335-67-1	
PFHxS*	Not detected	10		ng/L	2.08	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.08	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.08	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.08	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.08	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.08	375-92-8	
PFDA*	Not detected	10		ng/L	2.08	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.08	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.08	2991-50-6	
PFOS*	Not detected	10		ng/L	2.08	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.08	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2.08	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.08	2058-94-8	
PFNS*	Not detected	10		ng/L	2.08	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2.08	307-55-1	
PFDS*	Not detected	10		ng/L	2.08	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.08	72629-94-8	
FOSA*	Not detected	10		ng/L	2.08	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.08	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.08	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.08	756426-58-1	
ADONA*	Not detected	10		ng/L	2.08	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.08	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12787.08
Sample Tag: SAN-10
Collected Date/Time: 03/18/2020 11:48
Matrix: Liquid
COC Reference: 129296

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.1	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/19/20 03:02, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2	375-22-4	
PFPeA*	Not detected	10		ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2	757124-72-4	
PFHxA*	Not detected	10		ng/L	2	307-24-4	
PFBS*	Not detected	10		ng/L	2	375-73-5	
PFHpA*	Not detected	10		ng/L	2	375-85-9	
PFPeS*	Not detected	10		ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2	27619-97-2	
PFOA*	Not detected	10		ng/L	2	335-67-1	
PFHxS*	Not detected	10		ng/L	2	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2	39108-34-4	
PFHpS*	Not detected	10		ng/L	2	375-92-8	
PFDA*	Not detected	10		ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2	2991-50-6	
PFOS*	29	10		ng/L	2	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2	1763-23-1-LN	
PFOS-BR*	24	10		ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2	2058-94-8	
PFNS*	Not detected	10		ng/L	2	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2	307-55-1	
PFDS*	Not detected	10		ng/L	2	335-77-3	
PFTrDA*	Not detected	10		ng/L	2	72629-94-8	
FOSA*	Not detected	10		ng/L	2	754-91-6	
PFTeDA*	Not detected	10		ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2	756426-58-1	
ADONA*	Not detected	10		ng/L	2	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12787.09
Sample Tag: SAN-11
Collected Date/Time: 03/18/2020 12:11
Matrix: Liquid
COC Reference: 129296

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.1	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/19/20 03:24, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	19		ng/L	1.94	375-22-4	
PFPeA*	Not detected	9.7		ng/L	1.94	2706-90-3	
4:2 FTSA*	Not detected	9.7		ng/L	1.94	757124-72-4	
PFHxA*	Not detected	9.7		ng/L	1.94	307-24-4	
PFBS*	9.9	9.7		ng/L	1.94	375-73-5	
PFHpA*	Not detected	9.7		ng/L	1.94	375-85-9	
PFPeS*	Not detected	9.7		ng/L	1.94	2706-91-4	
6:2 FTSA*	Not detected	9.7		ng/L	1.94	27619-97-2	
PFOA*	Not detected	9.7		ng/L	1.94	335-67-1	
PFHxS*	25	9.7		ng/L	1.94	355-46-4	
PFHxS-LN*	21	9.7		ng/L	1.94	355-46-4-LN	
PFHxS-BR*	Not detected	9.7		ng/L	1.94	355-46-4-BR	
PFNA*	Not detected	9.7		ng/L	1.94	375-95-1	
8:2 FTSA*	Not detected	9.7		ng/L	1.94	39108-34-4	
PFHpS*	Not detected	9.7		ng/L	1.94	375-92-8	
PFDA*	Not detected	9.7		ng/L	1.94	335-76-2	
N-MeFOSAA*	Not detected	9.7		ng/L	1.94	2355-31-9	
EtFOSAA*	Not detected	9.7		ng/L	1.94	2991-50-6	
PFOS*	160	9.7		ng/L	1.94	1763-23-1	
PFOS-LN*	62	9.7		ng/L	1.94	1763-23-1-LN	
PFOS-BR*	100	9.7		ng/L	1.94	1763-23-1-BR	
PFUnDA*	Not detected	9.7		ng/L	1.94	2058-94-8	
PFNS*	Not detected	9.7		ng/L	1.94	68259-12-1	
PFDoDA*	Not detected	9.7		ng/L	1.94	307-55-1	
PFDS*	Not detected	9.7		ng/L	1.94	335-77-3	
PFTrDA*	Not detected	9.7		ng/L	1.94	72629-94-8	
FOSA*	Not detected	9.7		ng/L	1.94	754-91-6	
PFTeDA*	Not detected	9.7		ng/L	1.94	376-06-7	
11Cl-PF3OUdS*	Not detected	9.7		ng/L	1.94	763051-92-9	
9Cl-PF3ONS*	Not detected	9.7		ng/L	1.94	756426-58-1	
ADONA*	Not detected	9.7		ng/L	1.94	919005-14-4	
HFPO-DA*	Not detected	9.7		ng/L	1.94	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12787.10
Sample Tag: SAN-12
Collected Date/Time: 03/18/2020 12:28
Matrix: Liquid
COC Reference: 129296

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.1	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/19/20 04:09, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.99	375-22-4	
PFPeA*	Not detected	10.0		ng/L	1.99	2706-90-3	
4:2 FTSA*	Not detected	10.0		ng/L	1.99	757124-72-4	
PFHxA*	Not detected	10.0		ng/L	1.99	307-24-4	
PFBS*	Not detected	10.0		ng/L	1.99	375-73-5	
PFHpA*	Not detected	10.0		ng/L	1.99	375-85-9	
PFPeS*	Not detected	10.0		ng/L	1.99	2706-91-4	
6:2 FTSA*	Not detected	10.0		ng/L	1.99	27619-97-2	
PFOA*	Not detected	10.0		ng/L	1.99	335-67-1	
PFHxS*	16	10.0		ng/L	1.99	355-46-4	
PFHxS-LN*	12	10.0		ng/L	1.99	355-46-4-LN	
PFHxS-BR*	Not detected	10.0		ng/L	1.99	355-46-4-BR	
PFNA*	Not detected	10.0		ng/L	1.99	375-95-1	
8:2 FTSA*	Not detected	10.0		ng/L	1.99	39108-34-4	
PFHpS*	Not detected	10.0		ng/L	1.99	375-92-8	
PFDA*	Not detected	10.0		ng/L	1.99	335-76-2	
N-MeFOSAA*	Not detected	10.0		ng/L	1.99	2355-31-9	
EtFOSAA*	Not detected	10.0		ng/L	1.99	2991-50-6	
PFOS*	110	10.0		ng/L	1.99	1763-23-1	
PFOS-LN*	48	10.0		ng/L	1.99	1763-23-1-LN	
PFOS-BR*	66	10.0		ng/L	1.99	1763-23-1-BR	
PFUnDA*	Not detected	10.0		ng/L	1.99	2058-94-8	
PFNS*	Not detected	10.0		ng/L	1.99	68259-12-1	
PFDoDA*	Not detected	10.0		ng/L	1.99	307-55-1	
PFDS*	Not detected	10.0		ng/L	1.99	335-77-3	
PFTrDA*	Not detected	10.0		ng/L	1.99	72629-94-8	
FOSA*	Not detected	10.0		ng/L	1.99	754-91-6	
PFTeDA*	Not detected	10.0		ng/L	1.99	376-06-7	
11Cl-PF3OUdS*	Not detected	10.0		ng/L	1.99	763051-92-9	
9Cl-PF3ONS*	Not detected	10.0		ng/L	1.99	756426-58-1	
ADONA*	Not detected	10.0		ng/L	1.99	919005-14-4	
HFPO-DA*	Not detected	10.0		ng/L	1.99	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S12787
Client: OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)
Project: RACER Coldwater Rd.
Submitted: 03/18/2020 13:40 Login User: SRS

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[ ] Yes	[ ] No	[X] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

129296

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere Part of Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: clifford.yantz@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RALER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Ryan Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (537)
12787.01	3/17/20	1452	SS-03	L	3	3							X
.02	3/17/20	1615	SAN-06										X
.03	3/18/20	935	SAN-07										X
.04	3/18/20	1008	SAN-08										X
.05	3/18/20	1025	SAN-1										X
.06	3/18/20	1100	SAN-09										X
.07	3/18/20	1145	Field Blank-031820		1	1							X
.08	3/18/20	1148	SAN-10		3	3							X
.09	3/18/20	1211	SAN-11										X
.10	3/18/20	1228	SAN-12										X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	OBG	☒ Sampler	DATE 3/18/20	TIME 1237	
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 3/18/20	TIME 18:37	
RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE 3/18/20	TIME 19:40	
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 3/18/20	TIME 1946	

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES:	TEMP. ON ARRIVAL 5.1
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S12850.01(01)
Generated on 03/27/2020

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S12850.01-S12850.14
Project: RACER Coldwater Rd.
Collected Date(s): 03/19/2020
Submitted Date/Time: 03/19/2020 15:10
Sampled by: Kevin Schneider
P.O. #: 11900504

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Sample Summary (14 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S12850.01	SAN-13	Liquid	03/19/20 08:34
S12850.02	SAN-14	Liquid	03/19/20 08:45
S12850.03	SAN-15	Liquid	03/19/20 08:55
S12850.04	SAN-16	Liquid	03/19/20 09:10
S12850.05	SAN-17	Liquid	03/19/20 09:27
S12850.06	SAN-18	Liquid	03/19/20 10:10
S12850.07	MH-10E	Liquid	03/19/20 11:22
S12850.08	SS-04	Liquid	03/19/20 11:34
S12850.09	SS-05	Liquid	03/19/20 12:26
S12850.10	Field Blank - 031920	Liquid	03/19/20 12:29
S12850.11	SAN-19	Liquid	03/19/20 12:44
S12850.12	SAN-20	Liquid	03/19/20 12:56
S12850.13	SAN-DUP-1	Liquid	03/19/20 00:01
S12850.14	SAN-DUP-2	Liquid	03/19/20 00:01

Analytical Laboratory Report

Lab Sample ID: S12850.01
Sample Tag: SAN-13
Collected Date/Time: 03/19/2020 08:34
Matrix: Liquid
COC Reference: 129294

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 00:26, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	100		ng/L	2.01	375-22-4	
PFPeA*	Not detected	10		ng/L	2.01	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.01	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.01	307-24-4	
PFBS*	Not detected	10		ng/L	2.01	375-73-5	
PFHpA*	Not detected	10		ng/L	2.01	375-85-9	
PFPeS*	Not detected	10		ng/L	2.01	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.01	27619-97-2	
PFOA*	Not detected	10		ng/L	2.01	335-67-1	
PFHxS*	19	10		ng/L	2.01	355-46-4	
PFHxS-LN*	16	10		ng/L	2.01	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.01	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.01	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.01	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.01	375-92-8	
PFDA*	Not detected	10		ng/L	2.01	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.01	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.01	2991-50-6	
PFOS*	150	10		ng/L	2.01	1763-23-1	
PFOS-LN*	75	10		ng/L	2.01	1763-23-1-LN	
PFOS-BR*	75	10		ng/L	2.01	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.01	2058-94-8	
PFNS*	Not detected	10		ng/L	2.01	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2.01	307-55-1	
PFDS*	Not detected	10		ng/L	2.01	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.01	72629-94-8	
FOSA*	Not detected	10		ng/L	2.01	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.01	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.01	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.01	756426-58-1	
ADONA*	Not detected	10		ng/L	2.01	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.01	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12850.02
Sample Tag: SAN-14
Collected Date/Time: 03/19/2020 08:45
Matrix: Liquid
COC Reference: 129294

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 00:48, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	100		ng/L	2.06	375-22-4	
PFPeA*	Not detected	10		ng/L	2.06	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.06	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.06	307-24-4	
PFBS*	Not detected	10		ng/L	2.06	375-73-5	
PFHpA*	Not detected	10		ng/L	2.06	375-85-9	
PFPeS*	Not detected	10		ng/L	2.06	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.06	27619-97-2	
PFOA*	Not detected	10		ng/L	2.06	335-67-1	
PFHxS*	Not detected	10		ng/L	2.06	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.06	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.06	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.06	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.06	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.06	375-92-8	
PFDA*	Not detected	10		ng/L	2.06	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.06	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.06	2991-50-6	
PFOS*	29	10		ng/L	2.06	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.06	1763-23-1-LN	
PFOS-BR*	20	10		ng/L	2.06	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.06	2058-94-8	
PFNS*	Not detected	10		ng/L	2.06	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2.06	307-55-1	
PFDS*	Not detected	10		ng/L	2.06	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.06	72629-94-8	
FOSA*	Not detected	10		ng/L	2.06	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.06	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.06	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.06	756426-58-1	
ADONA*	Not detected	10		ng/L	2.06	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.06	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12850.03
Sample Tag: SAN-15
Collected Date/Time: 03/19/2020 08:55
Matrix: Liquid
COC Reference: 129294

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 01:10, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	98		ng/L	1.95	375-22-4	
PFPeA*	Not detected	9.8		ng/L	1.95	2706-90-3	
4:2 FTSA*	Not detected	9.8		ng/L	1.95	757124-72-4	
PFHxA*	Not detected	9.8		ng/L	1.95	307-24-4	
PFBS*	Not detected	9.8		ng/L	1.95	375-73-5	
PFHpA*	Not detected	9.8		ng/L	1.95	375-85-9	
PFPeS*	Not detected	9.8		ng/L	1.95	2706-91-4	
6:2 FTSA*	Not detected	9.8		ng/L	1.95	27619-97-2	
PFOA*	Not detected	9.8		ng/L	1.95	335-67-1	
PFHxS*	Not detected	9.8		ng/L	1.95	355-46-4	
PFHxS-LN*	Not detected	9.8		ng/L	1.95	355-46-4-LN	
PFHxS-BR*	Not detected	9.8		ng/L	1.95	355-46-4-BR	
PFNA*	Not detected	9.8		ng/L	1.95	375-95-1	
8:2 FTSA*	Not detected	9.8		ng/L	1.95	39108-34-4	
PFHpS*	Not detected	9.8		ng/L	1.95	375-92-8	
PFDA*	Not detected	9.8		ng/L	1.95	335-76-2	
N-MeFOSAA*	Not detected	9.8		ng/L	1.95	2355-31-9	
EtFOSAA*	Not detected	9.8		ng/L	1.95	2991-50-6	
PFOS*	35	9.8		ng/L	1.95	1763-23-1	
PFOS-LN*	12	9.8		ng/L	1.95	1763-23-1-LN	
PFOS-BR*	20	9.8		ng/L	1.95	1763-23-1-BR	
PFUnDA*	Not detected	9.8		ng/L	1.95	2058-94-8	
PFNS*	Not detected	9.8		ng/L	1.95	68259-12-1	
PFDoDA*	Not detected	9.8		ng/L	1.95	307-55-1	
PFDS*	Not detected	9.8		ng/L	1.95	335-77-3	
PFTrDA*	Not detected	9.8		ng/L	1.95	72629-94-8	
FOSA*	Not detected	9.8		ng/L	1.95	754-91-6	
PFTeDA*	Not detected	9.8		ng/L	1.95	376-06-7	
11Cl-PF3OUdS*	Not detected	9.8		ng/L	1.95	763051-92-9	
9Cl-PF3ONS*	Not detected	9.8		ng/L	1.95	756426-58-1	
ADONA*	Not detected	9.8		ng/L	1.95	919005-14-4	
HFPO-DA*	Not detected	9.8		ng/L	1.95	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12850.04
Sample Tag: SAN-16
Collected Date/Time: 03/19/2020 09:10
Matrix: Liquid
COC Reference: 129294

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 01:32, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	100		ng/L	2.03	375-22-4	
PFPeA*	Not detected	10		ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.03	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.03	307-24-4	
PFBS*	12	10		ng/L	2.03	375-73-5	
PFHpA*	Not detected	10		ng/L	2.03	375-85-9	
PFPeS*	Not detected	10		ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.03	27619-97-2	
PFOA*	Not detected	10		ng/L	2.03	335-67-1	
PFHxS*	Not detected	10		ng/L	2.03	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.03	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.03	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.03	375-92-8	
PFDA*	Not detected	10		ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.03	2991-50-6	
PFOS*	13	10		ng/L	2.03	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.03	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.03	2058-94-8	
PFNS*	Not detected	10		ng/L	2.03	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2.03	307-55-1	
PFDS*	Not detected	10		ng/L	2.03	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.03	72629-94-8	
FOSA*	Not detected	10		ng/L	2.03	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.03	756426-58-1	
ADONA*	Not detected	10		ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.03	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12850.05
Sample Tag: SAN-17
Collected Date/Time: 03/19/2020 09:27
Matrix: Liquid
COC Reference: 129294

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 01:54, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	96		ng/L	1.92	375-22-4	
PFPeA*	Not detected	9.6		ng/L	1.92	2706-90-3	
4:2 FTSA*	Not detected	9.6		ng/L	1.92	757124-72-4	
PFHxA*	Not detected	9.6		ng/L	1.92	307-24-4	
PFBS*	Not detected	9.6		ng/L	1.92	375-73-5	
PFHpA*	Not detected	9.6		ng/L	1.92	375-85-9	
PFPeS*	Not detected	9.6		ng/L	1.92	2706-91-4	
6:2 FTSA*	Not detected	9.6		ng/L	1.92	27619-97-2	
PFOA*	Not detected	9.6		ng/L	1.92	335-67-1	
PFHxS*	Not detected	9.6		ng/L	1.92	355-46-4	
PFHxS-LN*	Not detected	9.6		ng/L	1.92	355-46-4-LN	
PFHxS-BR*	Not detected	9.6		ng/L	1.92	355-46-4-BR	
PFNA*	Not detected	9.6		ng/L	1.92	375-95-1	
8:2 FTSA*	Not detected	9.6		ng/L	1.92	39108-34-4	
PFHpS*	Not detected	9.6		ng/L	1.92	375-92-8	
PFDA*	Not detected	9.6		ng/L	1.92	335-76-2	
N-MeFOSAA*	Not detected	9.6		ng/L	1.92	2355-31-9	
EtFOSAA*	Not detected	9.6		ng/L	1.92	2991-50-6	
PFOS*	Not detected	9.6		ng/L	1.92	1763-23-1	
PFOS-LN*	Not detected	9.6		ng/L	1.92	1763-23-1-LN	
PFOS-BR*	Not detected	9.6		ng/L	1.92	1763-23-1-BR	
PFUnDA*	Not detected	9.6		ng/L	1.92	2058-94-8	
PFNS*	Not detected	9.6		ng/L	1.92	68259-12-1	
PFDoDA*	Not detected	9.6		ng/L	1.92	307-55-1	
PFDS*	Not detected	9.6		ng/L	1.92	335-77-3	
PFTrDA*	Not detected	9.6		ng/L	1.92	72629-94-8	
FOSA*	Not detected	9.6		ng/L	1.92	754-91-6	
PFTeDA*	Not detected	9.6		ng/L	1.92	376-06-7	
11Cl-PF3OUdS*	Not detected	9.6		ng/L	1.92	763051-92-9	
9Cl-PF3ONS*	Not detected	9.6		ng/L	1.92	756426-58-1	
ADONA*	Not detected	9.6		ng/L	1.92	919005-14-4	
HFPO-DA*	Not detected	9.6		ng/L	1.92	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12850.10
Sample Tag: Field Blank - 031920
Collected Date/Time: 03/19/2020 12:29
Matrix: Liquid
COC Reference: 129294

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 03:46, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	100		ng/L	2.08	375-22-4	
PFPeA*	Not detected	10		ng/L	2.08	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.08	757124-72-4	
PFHxA*	Not detected	10		ng/L	2.08	307-24-4	
PFBS*	Not detected	10		ng/L	2.08	375-73-5	
PFHpA*	Not detected	10		ng/L	2.08	375-85-9	
PFPeS*	Not detected	10		ng/L	2.08	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.08	27619-97-2	
PFOA*	Not detected	10		ng/L	2.08	335-67-1	
PFHxS*	Not detected	10		ng/L	2.08	355-46-4	
PFHxS-LN*	Not detected	10		ng/L	2.08	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.08	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.08	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.08	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.08	375-92-8	
PFDA*	Not detected	10		ng/L	2.08	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.08	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.08	2991-50-6	
PFOS*	Not detected	10		ng/L	2.08	1763-23-1	
PFOS-LN*	Not detected	10		ng/L	2.08	1763-23-1-LN	
PFOS-BR*	Not detected	10		ng/L	2.08	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.08	2058-94-8	
PFNS*	Not detected	10		ng/L	2.08	68259-12-1	
PFDoDA*	Not detected	10		ng/L	2.08	307-55-1	
PFDS*	Not detected	10		ng/L	2.08	335-77-3	
PFTrDA*	Not detected	10		ng/L	2.08	72629-94-8	
FOSA*	Not detected	10		ng/L	2.08	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.08	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.08	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.08	756426-58-1	
ADONA*	Not detected	10		ng/L	2.08	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.08	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S12850.13
Sample Tag: SAN-DUP-1
Collected Date/Time: 03/19/2020 00:01
Matrix: Liquid
COC Reference: 129295

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.3	IR

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/20 04:52, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	99		ng/L	1.97	375-22-4	
PFPeA*	Not detected	9.9		ng/L	1.97	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.97	757124-72-4	
PFHxA*	Not detected	9.9		ng/L	1.97	307-24-4	
PFBS*	Not detected	9.9		ng/L	1.97	375-73-5	
PFHpA*	Not detected	9.9		ng/L	1.97	375-85-9	
PFPeS*	Not detected	9.9		ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.97	27619-97-2	
PFOA*	Not detected	9.9		ng/L	1.97	335-67-1	
PFHxS*	Not detected	9.9		ng/L	1.97	355-46-4	
PFHxS-LN*	Not detected	9.9		ng/L	1.97	355-46-4-LN	
PFHxS-BR*	Not detected	9.9		ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.97	39108-34-4	
PFHpS*	Not detected	9.9		ng/L	1.97	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.97	2991-50-6	
PFOS*	Not detected	9.9		ng/L	1.97	1763-23-1	
PFOS-LN*	Not detected	9.9		ng/L	1.97	1763-23-1-LN	
PFOS-BR*	Not detected	9.9		ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.97	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.97	68259-12-1	
PFDoDA*	Not detected	9.9		ng/L	1.97	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.97	335-77-3	
PFTrDA*	Not detected	9.9		ng/L	1.97	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.97	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.97	376-06-7	
11Cl-PF3OUdS*	Not detected	9.9		ng/L	1.97	763051-92-9	
9Cl-PF3ONS*	Not detected	9.9		ng/L	1.97	756426-58-1	
ADONA*	Not detected	9.9		ng/L	1.97	919005-14-4	
HFPO-DA*	Not detected	9.9		ng/L	1.97	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S12850
Client: OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)
Project: RACER Coldwater Rd.
Submitted: 03/19/2020 15:10 Login User: BJB

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

129294

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien + Gere Part of Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.:
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com P.O. NO.: QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Silander

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (7979)
12850.01	3/19/20	834	SAN-13	L	3	3							X
.02		845	SAN-14										X
.03		855	SAN-15										X
.04		910	SAN-16										X
.05		927	SAN-17										X
.06		1010	SAN-18										X
.07		1120	MH-10E										X
.08		1134	SS-04										X
.09		1226	SS-05										X
.10		1229	Field Blank-031920		1	1							X
.11		1244	SAN-19		3	3							X
.12		1256	SAN-20		3	3							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] X Sampler OBG DATE 3/19/20 TIME 1311
RECEIVED BY: SIGNATURE/ORGANIZATION: Doug A. Miller DATE 3/19/20 TIME 13:11
RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] DATE 3/19/20 TIME 1505
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION: Barbara Ball DATE 3/19/2020 TIME 1570

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

129295

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere Part of Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: clifford.yantz@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Erin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (3979)
12890.13	3/19/20	—	SAN-DUP-1	L	3	3							X
.14	3/19/20	—	SS-DUP-2	L	3	3							X

VOCs

RELINQUISHED BY: SIGNATURE/ORGANIZATION: ☒ Sampler OBG DATE 3/19/20 TIME 1311
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE 3/19/20 TIME 1311
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE 3/19/20 TIME 1510
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION: BaltaBall DATE 3/19/2020 TIME 1510

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S15207.01(01)
Generated on 07/17/2020

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S15207.01-S15207.07
Project: RACER Coldwater Rd
Collected Date(s): 06/25/2020
Submitted Date/Time: 06/25/2020 15:45
Sampled by: Kevin Schneider
P.O. #: 12000277

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15207.01	SAN-14	Groundwater	06/25/20 12:14
S15207.02	SAN-12	Groundwater	06/25/20 12:27
S15207.03	SAN-06	Groundwater	06/25/20 12:50
S15207.04	SAN-21	Groundwater	06/25/20 13:09
S15207.05	SAN-10	Groundwater	06/25/20 13:21
S15207.06	SAN-3	Groundwater	06/25/20 13:35
S15207.07	Field Blank 062520	Water	06/25/20 10:13

Analytical Laboratory Report

Lab Sample ID: S15207.01
Sample Tag: SAN-14
Collected Date/Time: 06/25/2020 12:14
Matrix: Groundwater
COC Reference: 125019

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.92/6.88/10	ASTMD7979-19M	07/01/20 15:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/02/20 07:11, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	12	9.9	9.9	ng/L	1.98	375-22-4	
PFPeA*	2.1	4.0	0.99	ng/L	1.98	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.98	757124-72-4	
PFHxA*	1.8	2.0	1.4	ng/L	1.98	307-24-4	J
PFBS*	2.5	2.0	1.4	ng/L	1.98	375-73-5	
PFHpA*	1.6	2.0	1.4	ng/L	1.98	375-85-9	J
PFPeS*	Not detected	2.0	1.8	ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.98	27619-97-2	
PFOA*	4.4	2.0	1.6	ng/L	1.98	335-67-1	
PFHxS*	2.9	2.0	1.6	ng/L	1.98	355-46-4	
PFHxS-LN*	2.0	2.0	1.6	ng/L	1.98	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.98	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.98	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	1.98	2991-50-6	
PFOS*	23	2.0	1.9	ng/L	1.98	1763-23-1	
PFOS-LN*	8.7	2.0	1.9	ng/L	1.98	1763-23-1-LN	
PFOS-BR*	13	2.0	1.9	ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.98	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.98	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.98	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.98	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.98	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.98	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	1.98	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.98	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.98	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.98	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.98	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S15207.02
Sample Tag: SAN-12
Collected Date/Time: 06/25/2020 12:27
Matrix: Groundwater
COC Reference: 125019

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.26/6.85/11	ASTMD7979-19M	07/01/20 15:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/02/20 07:31, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	15	10	10	ng/L	2.03	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.03	757124-72-4	I
PFHxA*	Not detected	2.0	1.4	ng/L	2.03	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	2.03	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.03	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.03	27619-97-2	I
PFOA*	Not detected	2.0	1.6	ng/L	2.03	335-67-1	
PFHxS*	2.1	2.0	1.6	ng/L	2.03	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	2.03	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.03	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.03	2991-50-6	I
PFOS*	55	2.0	2.0	ng/L	2.03	1763-23-1	
PFOS-LN*	32	2.0	2.0	ng/L	2.03	1763-23-1-LN	
PFOS-BR*	21	2.0	2.0	ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.03	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.03	307-55-1	I
PFDS*	Not detected	2.0	1.4	ng/L	2.03	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.03	72629-94-8	I
FOSA*	Not detected	2.0	1.8	ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.03	13252-13-6	

I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S15207.03
Sample Tag: SAN-06
Collected Date/Time: 06/25/2020 12:50
Matrix: Groundwater
COC Reference: 125019

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.27/6.69/11	ASTMD7979-19M	07/01/20 15:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/02/20 07:50, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	13	9.9	9.9	ng/L	1.97	375-22-4	
PFPeA*	1.3	3.9	0.99	ng/L	1.97	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.97	757124-72-4	I
PFHxA*	Not detected	2.0	1.4	ng/L	1.97	307-24-4	
PFBS*	3.1	2.0	1.4	ng/L	1.97	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.97	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.97	27619-97-2	I
PFOA*	Not detected	2.0	1.6	ng/L	1.97	335-67-1	
PFHxS*	11	2.0	1.6	ng/L	1.97	355-46-4	
PFHxS-LN*	9.0	2.0	1.6	ng/L	1.97	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.97	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.97	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.97	2991-50-6	I
PFOS*	21	2.0	1.9	ng/L	1.97	1763-23-1	
PFOS-LN*	5.7	2.0	1.9	ng/L	1.97	1763-23-1-LN	
PFOS-BR*	16	2.0	1.9	ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.97	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.97	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.97	307-55-1	I
PFDS*	Not detected	2.0	1.4	ng/L	1.97	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.97	72629-94-8	I
FOSA*	Not detected	2.0	1.8	ng/L	1.97	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.97	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.97	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.97	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.97	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.97	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL
I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S15207.05
Sample Tag: SAN-10
Collected Date/Time: 06/25/2020 13:21
Matrix: Groundwater
COC Reference: 125019

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.32/6.72/11	ASTMD7979-19M	07/01/20 15:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/02/20 08:29, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	10	9.8	9.8	ng/L	1.96	375-22-4	
PFPeA*	Not detected	3.9	0.98	ng/L	1.96	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.96	757124-72-4	I
PFHxA*	Not detected	2.0	1.4	ng/L	1.96	307-24-4	
PFBS*	5.2	2.0	1.4	ng/L	1.96	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.96	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.96	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.96	27619-97-2	I
PFOA*	Not detected	2.0	1.6	ng/L	1.96	335-67-1	
PFHxS*	9.5	2.0	1.6	ng/L	1.96	355-46-4	
PFHxS-LN*	7.7	2.0	1.6	ng/L	1.96	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.96	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.96	375-95-1	
8:2 FTSA*	Not detected	2.0	0.98	ng/L	1.96	39108-34-4	I
PFHpS*	Not detected	2.0	2.0	ng/L	1.96	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.96	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.96	2355-31-9	I
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.96	2991-50-6	I
PFOS*	26	2.0	1.9	ng/L	1.96	1763-23-1	
PFOS-LN*	6.2	2.0	1.9	ng/L	1.96	1763-23-1-LN	
PFOS-BR*	19	2.0	1.9	ng/L	1.96	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.96	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.96	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.96	307-55-1	I
PFDS*	Not detected	2.0	1.4	ng/L	1.96	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.96	72629-94-8	I
FOSA*	Not detected	2.0	1.8	ng/L	1.96	754-91-6	I
PFTeDA*	Not detected	3.9	1.8	ng/L	1.96	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.96	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.96	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.96	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.96	13252-13-6	

I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S15207.06
Sample Tag: SAN-3
Collected Date/Time: 06/25/2020 13:35
Matrix: Groundwater
COC Reference: 125019

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.21/6.81/11	ASTMD7979-19M	07/01/20 15:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/02/20 22:01, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	25	10	10	ng/L	2.04	375-22-4	
PFPeA*	5.0	4.1	1.0	ng/L	2.04	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.04	757124-72-4	
PFHxA*	5.4	2.0	1.4	ng/L	2.04	307-24-4	
PFBS*	9.3	2.0	1.4	ng/L	2.04	375-73-5	
PFHpA*	3.1	2.0	1.4	ng/L	2.04	375-85-9	
PFPeS*	11	2.0	1.8	ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.04	27619-97-2	
PFOA*	9.8	2.0	1.6	ng/L	2.04	335-67-1	
PFHxS*	63	2.0	1.6	ng/L	2.04	355-46-4	
PFHxS-LN*	55	2.0	1.6	ng/L	2.04	355-46-4-LN	
PFHxS-BR*	7.9	2.0	1.6	ng/L	2.04	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.04	39108-34-4	
PFHpS*	9.9	2.0	2.0	ng/L	2.04	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.04	2991-50-6	
PFOS*	230	2.0	2.0	ng/L	2.04	1763-23-1	
PFOS-LN*	55	2.0	2.0	ng/L	2.04	1763-23-1-LN	
PFOS-BR*	170	2.0	2.0	ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.04	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.04	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.04	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.04	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.04	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.04	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.04	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.04	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S15207.07
Sample Tag: Field Blank 062520
Collected Date/Time: 06/25/2020 10:13
Matrix: Water
COC Reference: 125016

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.27/6.75/11	ASTMD7979-19M	07/01/20 15:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/02/20 09:08, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	18	10.0	10.0	ng/L	1.99	375-22-4	
PFPeA*	Not detected	4.0	1.00	ng/L	1.99	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.99	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	1.99	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	1.99	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.99	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.99	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.99	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.99	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	1.99	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	1.99	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.99	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.99	375-95-1	
8:2 FTSA*	Not detected	2.0	1.00	ng/L	1.99	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.99	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.99	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.99	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	1.99	2991-50-6	
PFOS*	Not detected	2.0	2.0	ng/L	1.99	1763-23-1	
PFOS-LN*	Not detected	2.0	2.0	ng/L	1.99	1763-23-1-LN	
PFOS-BR*	Not detected	2.0	2.0	ng/L	1.99	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.99	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.99	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.99	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.99	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.99	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.99	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	1.99	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.99	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.99	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.99	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.99	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S15207
Client: OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)
Project: RACER Coldwater Rd
Submitted: 06/25/2020 15:45 Login User: MMC

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

125019

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere, A Ramboll Company
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-533-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater RS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (ASTM D7979)	ANALYSIS
15207.01	6/25/20	1214	SAN-14	L	3	3							X	
.02		1227	SAN-12										X	
.03		1250	SAN-06										X	
.04		1309	SAN-21										X	
.05		1321	SAN-10										X	
.06	↓	1335	SAN-3	↓	↓	↓							X	
.07														

BS

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

ASTM D7979 low level Reporting limit with estimated values

Please include sample "Field Blank-062520" on report, in same cooler. (S15207.07)

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
Will Loughner		6/25/20	1545
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		6/25/2020	1545
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 2.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S16244.01(01)
Generated on 08/25/2020

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S16244.01-S16244.08
Project: RACER Coldwater Rd
Collected Date(s): 08/03/2020
Submitted Date/Time: 08/04/2020 14:10
Sampled by: Willl Laughner
P.O. #: 12000277

Table of Contents

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S16244.01	SS-NL	Groundwater	08/03/20 13:12
S16244.02	SS-NP	Groundwater	08/03/20 13:17
S16244.03	SW-02	Groundwater	08/03/20 13:28
S16244.04	MH-18	Groundwater	08/03/20 15:00
S16244.05	MH-17A	Groundwater	08/03/20 16:28
S16244.06	MH-10E-W	Groundwater	08/03/20 17:02
S16244.07	MH-10E	Groundwater	08/03/20 17:12
S16244.08	FB-080320	Water	08/03/20 13:08

Analytical Laboratory Report

Lab Sample ID: S16244.04
Sample Tag: MH-18
Collected Date/Time: 08/03/2020 15:00
Matrix: Groundwater
COC Reference: 135891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.37/6.88/11	ASTMD7979-19M	08/05/20 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 08/06/20 13:22, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2	375-22-4	
PFPeA*	Not detected	4.0	1.0	ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	2	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	2	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2	375-85-9	
PFPeS*	2.2	2.0	1.8	ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2	335-67-1	
PFHxS*	8.6	2.0	1.6	ng/L	2	355-46-4	
PFHxS-LN*	7.4	2.0	1.6	ng/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2	39108-34-4	
PFHpS*	2.5	2.0	2.0	ng/L	2	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	2	2991-50-6	
PFOS*	240	2.0	2.0	ng/L	2	1763-23-1	
PFOS-LN*	150	2.0	2.0	ng/L	2	1763-23-1-LN	
PFOS-BR*	88	2.0	2.0	ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S16244.08
Sample Tag: FB-080320
Collected Date/Time: 08/03/2020 13:08
Matrix: Water
COC Reference: 135891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	13.03/6.88/12	ASTMD7979-19M	08/05/20 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 08/06/20 14:40, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.8	9.8	ng/L	1.95	375-22-4	
PFPeA*	Not detected	3.9	0.98	ng/L	1.95	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.95	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	1.95	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	1.95	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.95	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.95	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.95	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.95	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	1.95	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	1.95	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.95	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.95	375-95-1	
8:2 FTSA*	Not detected	2.0	0.98	ng/L	1.95	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.95	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.95	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.95	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.95	2991-50-6	
PFOS*	Not detected	2.0	1.9	ng/L	1.95	1763-23-1	
PFOS-LN*	Not detected	2.0	1.9	ng/L	1.95	1763-23-1-LN	
PFOS-BR*	Not detected	2.0	1.9	ng/L	1.95	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.95	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.95	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.95	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.95	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.95	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.95	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.95	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.95	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.95	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.95	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.95	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S16244
Client: OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)
Project: RACER Coldwater Rd
Submitted: 08/04/2020 14:10 Login User: SRS

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[ ] Yes	[ ] No	[X] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

135891

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz.
COMPANY: Ramboll
ADDRESS: 2260 E Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.:
P.O. NO.:
E-MAIL ADDRESS: clifford.yantz@ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd.
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Will Laughner

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (7978)	Special Instructions
16244.01	8/3/20	1312	SS - NL	GW	3								X	Low level
.02	8/3/20	1317	SS - NP	GW	3								X	PFAS analysis
.03	8/3/20	1328	SW - 02	GW	3								X	
.04	8/3/20	1500	MH - 18	GW	3								X	
.05	8/3/20	1628	MH - 17A	GW	3								X	
.06	8/3/20	1702	MH - 10E - W	GW	3								X	
.07	8/3/20	1712	MH - 10E	GW	3								X	
.08	8/3/20	1308	FB - 080320	QC	1								X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Will Laughner Ramboll ☐ Sampler	DATE: 8/4/20	TIME: 10:41
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE: 8/4/20	TIME: 10:41
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE: 8/4/20	TIME: 14:10
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE: 8/4/20	TIME: 1410

RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S17030.01(01)
Generated on 09/10/2020

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S17030.01-S17030.04
Project: RACER Coldwater Rd
Collected Date(s): 08/28/2020
Submitted Date/Time: 08/28/2020 14:41
Sampled by: Kevin Schneider
P.O. #: 12000277

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S17030.01	SS-06	Liquid	08/28/20 12:04
S17030.02	SS-07	Liquid	08/28/20 11:47
S17030.03	Field Blank - 082820	Liquid	08/28/20 11:45
S17030.04	SS-08	Liquid	08/28/20 13:10

Analytical Laboratory Report

Lab Sample ID: S17030.01
Sample Tag: SS-06
Collected Date/Time: 08/28/2020 12:04
Matrix: Liquid
COC Reference: 135893

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.83/6.94/12	ASTMD7979-19M	09/02/20 14:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/05/20 12:34, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.04	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.04	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.04	757124-72-4	
PFHxA*	1.8	2.0	1.4	ng/L	2.04	307-24-4	J
PFBS*	2.1	2.0	1.4	ng/L	2.04	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.04	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.04	27619-97-2	
PFOA*	2.6	2.0	1.6	ng/L	2.04	335-67-1	
PFHxS*	3.4	2.0	1.6	ng/L	2.04	355-46-4	
PFHxS-LN*	2.4	2.0	1.6	ng/L	2.04	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.04	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.04	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2.04	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.04	2991-50-6	
PFOS*	85	2.0	2.0	ng/L	2.04	1763-23-1	
PFOS-LN*	49	2.0	2.0	ng/L	2.04	1763-23-1-LN	
PFOS-BR*	37	2.0	2.0	ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.04	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.04	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.04	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.04	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.04	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.04	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.04	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.04	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S17030.03
Sample Tag: Field Blank - 082820
Collected Date/Time: 08/28/2020 11:45
Matrix: Liquid
COC Reference: 135893

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.26/6.90/11	ASTMD7979-19M	09/02/20 14:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/05/20 13:13, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.05	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.05	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.6	ng/L	2.05	757124-72-4	
PFHxA*	Not detected	2.1	1.4	ng/L	2.05	307-24-4	
PFBS*	Not detected	2.1	1.4	ng/L	2.05	375-73-5	
PFHpA*	Not detected	2.1	1.4	ng/L	2.05	375-85-9	
PFPeS*	Not detected	2.1	1.8	ng/L	2.05	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.05	27619-97-2	
PFOA*	Not detected	2.1	1.6	ng/L	2.05	335-67-1	
PFHxS*	Not detected	2.1	1.6	ng/L	2.05	355-46-4	
PFHxS-LN*	Not detected	2.1	1.6	ng/L	2.05	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.6	ng/L	2.05	355-46-4-BR	
PFNA*	Not detected	2.1	1.8	ng/L	2.05	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.05	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.05	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.05	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.05	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.05	2991-50-6	
PFOS*	Not detected	2.1	2.0	ng/L	2.05	1763-23-1	
PFOS-LN*	Not detected	2.1	2.0	ng/L	2.05	1763-23-1-LN	
PFOS-BR*	Not detected	2.1	2.0	ng/L	2.05	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.05	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.05	68259-12-1	
PFDoDA*	Not detected	2.1	1.6	ng/L	2.05	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.05	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.05	72629-94-8	
FOSA*	Not detected	2.1	1.8	ng/L	2.05	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.05	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.8	ng/L	2.05	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.05	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.05	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.05	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S17030
Client: OBG02 (O'Brien & Gere Engineers, Inc. - East Lansing, MI)
Project: RACER Coldwater Rd
Submitted: 08/28/2020 14:41 Login User: REJ

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@obg.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.6
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

135893

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere, A Ramboll Company
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☒ OTHER 8 DAY TAT

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (ASTM ???)	Special Instructions
17030.01	8/28/20	1204	SS-06	L	3	3							X	Low level Reporting
.02		1147	SS-07	L	3	3							X	limit with estimated
.03		1145	Field Blank-082820	QC	1	1							X	values
.04		1310	SS-08	L	3	3							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	OBG ☒ Sampler	8/28/20	1333
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		8/28/20	1330
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		8/28/20	1441
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		8/28/20	1441

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 3.6

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S20216.01(01)
Generated on 01/14/2021

Report to

Attention: Clifford Yantz
Ramboll Americas
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S20216.01-S20216.16
Project: RACER Coldwater Road
Collected Date(s): 12/18/2020
Submitted Date/Time: 12/18/2020 16:55
Sampled by: Kevin Schneider
P.O. #: 12000277

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Sample Summary (16 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S20216.01	SAN-21	Liquid	12/18/20 09:20
S20216.02	SAN-08	Liquid	12/18/20 09:38
S20216.03	SAN-1	Liquid	12/18/20 09:54
S20216.04	MH-18	Liquid	12/18/20 10:27
S20216.05	SS-06	Liquid	12/18/20 11:38
S20216.06	SS-07	Liquid	12/18/20 11:48
S20216.07	SAN-3	Liquid	12/18/20 14:00
S20216.08	SAN-10	Liquid	12/18/20 14:05
S20216.09	SAN-06	Liquid	12/18/20 14:15
S20216.10	FieldBlank-121820	Liquid	12/18/20 14:42
S20216.11	SAN-12	Liquid	12/18/20 14:45
S20216.12	SAN-14	Liquid	12/18/20 15:00
S20216.13	SS-09	Liquid	12/18/20 15:18
S20216.14	MH-10E	Liquid	12/18/20 15:25
S20216.15	SAN-DUP-121820	Liquid	12/18/20 00:01
S20216.16	SS-DUP-121820	Liquid	12/18/20 00:01

Analytical Laboratory Report

Lab Sample ID: S20216.04
Sample Tag: MH-18
Collected Date/Time: 12/18/2020 10:27
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.40/6.99/11	ASTMD7979-19M	12/22/20 13:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/29/20 00:32, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.03	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.03	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	2.03	307-24-4	
PFBS*	4.8	2.0	1.4	ng/L	2.03	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.03	375-85-9	
PFPeS*	8.1	2.0	1.8	ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.03	27619-97-2	
PFOA*	1.8	2.0	1.6	ng/L	2.03	335-67-1	J
PFHxS*	33	2.0	1.6	ng/L	2.03	355-46-4	
PFHxS-LN*	28	2.0	1.6	ng/L	2.03	355-46-4-LN	
PFHxS-BR*	4.3	2.0	1.6	ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.03	39108-34-4	
PFHpS*	9.8	2.0	2.0	ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.03	2991-50-6	
PFOS*	460	2.0	2.0	ng/L	2.03	1763-23-1	
PFOS-LN*	230	2.0	2.0	ng/L	2.03	1763-23-1-LN	
PFOS-BR*	230	2.0	2.0	ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.03	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.03	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.03	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S20216.05
Sample Tag: SS-06
Collected Date/Time: 12/18/2020 11:38
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.63/7.06/11	ASTMD7979-19M	12/22/20 13:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/29/20 00:52, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.9	9.9	ng/L	1.97	375-22-4	
PFPeA*	20	3.9	0.99	ng/L	1.97	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.97	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	1.97	307-24-4	
PFBS*	1.6	2.0	1.4	ng/L	1.97	375-73-5	J
PFHpA*	Not detected	2.0	1.4	ng/L	1.97	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.97	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.97	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	1.97	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	1.97	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.97	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.97	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.97	2991-50-6	
PFOS*	3.6	2.0	1.9	ng/L	1.97	1763-23-1	
PFOS-LN*	Not detected	2.0	1.9	ng/L	1.97	1763-23-1-LN	
PFOS-BR*	Not detected	2.0	1.9	ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.97	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.97	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.97	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.97	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.97	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.97	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.97	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.97	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.97	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.97	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.97	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S20216.07
Sample Tag: SAN-3
Collected Date/Time: 12/18/2020 14:00
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.51/6.89/11	ASTMD7979-19M	12/22/20 13:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/29/20 22:46, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.8	9.8	ng/L	1.96	375-22-4	
PFPeA*	1.2	3.9	0.98	ng/L	1.96	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.96	757124-72-4	
PFHxA*	1.6	2.0	1.4	ng/L	1.96	307-24-4	J
PFBS*	8.6	2.0	1.4	ng/L	1.96	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.96	375-85-9	
PFPeS*	10	2.0	1.8	ng/L	1.96	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.96	27619-97-2	
PFOA*	3.3	2.0	1.6	ng/L	1.96	335-67-1	
PFHxS*	52	2.0	1.6	ng/L	1.96	355-46-4	
PFHxS-LN*	46	2.0	1.6	ng/L	1.96	355-46-4-LN	
PFHxS-BR*	6.5	2.0	1.6	ng/L	1.96	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.96	375-95-1	
8:2 FTSA*	Not detected	2.0	0.98	ng/L	1.96	39108-34-4	
PFHpS*	9.4	2.0	2.0	ng/L	1.96	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.96	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.96	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.96	2991-50-6	
PFOS*	210	2.0	1.9	ng/L	1.96	1763-23-1	
PFOS-LN*	38	2.0	1.9	ng/L	1.96	1763-23-1-LN	
PFOS-BR*	170	2.0	1.9	ng/L	1.96	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.96	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.96	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.96	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.96	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.96	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.96	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.96	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.96	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.96	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.96	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.96	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S20216.08
Sample Tag: SAN-10
Collected Date/Time: 12/18/2020 14:05
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.14/7.09/10	ASTMD7979-19M	12/22/20 13:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/29/20 23:05, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.9	9.9	ng/L	1.98	375-22-4	
PFPeA*	Not detected	4.0	0.99	ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.98	757124-72-4	I
PFHxA*	Not detected	2.0	1.4	ng/L	1.98	307-24-4	
PFBS*	5.0	2.0	1.4	ng/L	1.98	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.98	375-85-9	
PFPeS*	2.2	2.0	1.8	ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.98	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.98	335-67-1	
PFHxS*	9.4	2.0	1.6	ng/L	1.98	355-46-4	
PFHxS-LN*	7.7	2.0	1.6	ng/L	1.98	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.98	39108-34-4	I
PFHpS*	Not detected	2.0	2.0	ng/L	1.98	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	1.98	2991-50-6	I
PFOS*	31	2.0	1.9	ng/L	1.98	1763-23-1	
PFOS-LN*	4.7	2.0	1.9	ng/L	1.98	1763-23-1-LN	
PFOS-BR*	25	2.0	1.9	ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.98	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.98	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.98	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.98	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.98	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.98	754-91-6	I
PFTeDA*	Not detected	4.0	1.8	ng/L	1.98	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.98	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.98	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.98	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.98	13252-13-6	

I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S20216.09
Sample Tag: SAN-06
Collected Date/Time: 12/18/2020 14:15
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.34/6.89/11	ASTMD7979-19M	12/22/20 13:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/29/20 23:25, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.02	375-22-4	
PFPeA*	Not detected	4.0	1.0	ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.02	757124-72-4	I
PFHxA*	Not detected	2.0	1.4	ng/L	2.02	307-24-4	
PFBS*	3.7	2.0	1.4	ng/L	2.02	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.02	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.02	27619-97-2	I
PFOA*	Not detected	2.0	1.6	ng/L	2.02	335-67-1	
PFHxS*	6.3	2.0	1.6	ng/L	2.02	355-46-4	
PFHxS-LN*	5.0	2.0	1.6	ng/L	2.02	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.02	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.02	39108-34-4	I
PFHpS*	Not detected	2.0	2.0	ng/L	2.02	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	2.02	2991-50-6	I
PFOS*	26	2.0	2.0	ng/L	2.02	1763-23-1	
PFOS-LN*	5.0	2.0	2.0	ng/L	2.02	1763-23-1-LN	
PFOS-BR*	19	2.0	2.0	ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.02	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.02	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.02	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.02	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.02	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.02	754-91-6	I
PFTeDA*	Not detected	4.0	1.8	ng/L	2.02	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.02	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.02	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.02	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.02	13252-13-6	

I-Matrix interference with internal standard

Lab Sample ID: S20216.10
Sample Tag: FieldBlank-121820
Collected Date/Time: 12/18/2020 14:42
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.17/6.86/11	ASTMD7979-19M	12/22/20 13:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/29/20 23:44, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.07	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.07	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.07	757124-72-4	
PFHxA*	Not detected	2.1	1.4	ng/L	2.07	307-24-4	
PFBS*	Not detected	2.1	1.4	ng/L	2.07	375-73-5	
PFHpA*	Not detected	2.1	1.4	ng/L	2.07	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.07	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.07	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.07	335-67-1	
PFHxS*	Not detected	2.1	1.7	ng/L	2.07	355-46-4	
PFHxS-LN*	Not detected	2.1	1.7	ng/L	2.07	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.07	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.07	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.07	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.07	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.07	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.07	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.07	2991-50-6	
PFOS*	Not detected	2.1	2.0	ng/L	2.07	1763-23-1	
PFOS-LN*	Not detected	2.1	2.0	ng/L	2.07	1763-23-1-LN	
PFOS-BR*	Not detected	2.1	2.0	ng/L	2.07	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.07	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.07	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.07	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.07	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.07	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.07	754-91-6	
PFTeDA*	Not detected	4.1	1.9	ng/L	2.07	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.07	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.07	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.07	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.07	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S20216.11
Sample Tag: SAN-12
Collected Date/Time: 12/18/2020 14:45
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.03/6.93/10	ASTMD7979-19M	12/22/20 15:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/23/20 23:22, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.8	9.8	ng/L	1.96	375-22-4	
PFPeA*	Not detected	3.9	0.98	ng/L	1.96	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.96	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	1.96	307-24-4	
PFBS*	2.3	2.0	1.4	ng/L	1.96	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.96	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.96	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.96	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.96	335-67-1	
PFHxS*	3.8	2.0	1.6	ng/L	1.96	355-46-4	
PFHxS-LN*	2.8	2.0	1.6	ng/L	1.96	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.96	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.96	375-95-1	
8:2 FTSA*	Not detected	2.0	0.98	ng/L	1.96	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.96	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.96	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.96	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.96	2991-50-6	
PFOS*	55	2.0	1.9	ng/L	1.96	1763-23-1	
PFOS-LN*	33	2.0	1.9	ng/L	1.96	1763-23-1-LN	
PFOS-BR*	21	2.0	1.9	ng/L	1.96	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.96	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.96	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.96	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.96	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.96	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.96	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.96	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.96	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.96	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.96	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.96	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S20216.12
Sample Tag: SAN-14
Collected Date/Time: 12/18/2020 15:00
Matrix: Liquid
COC Reference: 125027

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.96/6.93/10	ASTMD7979-19M	12/22/20 15:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/23/20 23:41, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10.0	10.0	ng/L	1.99	375-22-4	
PFPeA*	3.6	4.0	1.00	ng/L	1.99	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.99	757124-72-4	I
PFHxA*	3.8	2.0	1.4	ng/L	1.99	307-24-4	
PFBS*	11	2.0	1.4	ng/L	1.99	375-73-5	
PFHpA*	2.8	2.0	1.4	ng/L	1.99	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.99	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.99	27619-97-2	I
PFOA*	9.4	2.0	1.6	ng/L	1.99	335-67-1	
PFHxS*	6.2	2.0	1.6	ng/L	1.99	355-46-4	
PFHxS-LN*	4.3	2.0	1.6	ng/L	1.99	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.99	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.99	375-95-1	
8:2 FTSA*	Not detected	2.0	1.00	ng/L	1.99	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.99	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.99	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.99	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	1.99	2991-50-6	I
PFOS*	52	2.0	2.0	ng/L	1.99	1763-23-1	
PFOS-LN*	21	2.0	2.0	ng/L	1.99	1763-23-1-LN	
PFOS-BR*	30	2.0	2.0	ng/L	1.99	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.99	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.99	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.99	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.99	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.99	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.99	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	1.99	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.99	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.99	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.99	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.99	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL
I-Matrix interference with internal standard

Lab Sample ID: S20216.15
Sample Tag: SAN-DUP-121820
Collected Date/Time: 12/18/2020 00:01
Matrix: Liquid
COC Reference: 126039

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.47/7.07/11	ASTMD7979-19M	12/22/20 15:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 12/24/20 01:19, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.04	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.04	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.04	757124-72-4	I
PFHxA*	Not detected	2.0	1.4	ng/L	2.04	307-24-4	
PFBS*	4.0	2.0	1.4	ng/L	2.04	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.04	375-85-9	
PFPeS*	2.1	2.0	1.8	ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.04	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2.04	335-67-1	
PFHxS*	9.1	2.0	1.6	ng/L	2.04	355-46-4	
PFHxS-LN*	7.2	2.0	1.6	ng/L	2.04	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.04	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.04	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2.04	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.04	2991-50-6	I
PFOS*	33	2.0	2.0	ng/L	2.04	1763-23-1	
PFOS-LN*	4.9	2.0	2.0	ng/L	2.04	1763-23-1-LN	
PFOS-BR*	26	2.0	2.0	ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.04	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.04	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.04	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.04	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.04	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.04	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.04	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.04	13252-13-6	

I-Matrix interference with internal standard

Merit Laboratories Login Checklist

Lab Set ID: S20216
Client: OBG02 (Ramboll Americas - East Lansing, MI)
Project: RACER Coldwater Road
Submitted: 12/18/2020 16:55 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

125027

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (ASTM D7979)	Special Instructions
202160.01	12/18/20	920	SAN-21	Lw	3	3							X	ASTM D7979
.02	12/18/20	938	SAN-08	Lw	3	3							X	low level Reporting
.03	12/18/20	954	SAN-1	Lw	3	3							X	limit with estimated
.04	12/18/20	1027	MH-18	L	3	3							X	values
.05	12/18/20	1138	SS-06	L	3	3							X	
.06	12/18/20	1148	SS-07	L	3	3							X	
.07	12/18/20	1400	SAN-3	L	3	3							X	
.08	12/18/20	1405	SAN-10	L	3	3							X	
.09	12/18/20	1415	SAN-06	L	3	3							X	
.10	12/18/20	1442	Field Blank-121820	QC	1	1							X	
.11	12/18/20	1445	SAN-12	L	3	3							X	
.12	12/18/20	1500	SAN-14	L	3	3							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	X Sampler	DATE 12/18/20	TIME 1515
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/18/20	TIME 15:49
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 12/18/20	TIME 16:55
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/18/2020	TIME 1655

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

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C.O.C. PAGE # 2 OF 2

126039

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford, Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2060 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-337-6911 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (ASTM D7979)	Special Instructions
20216.13	12/18/20	1518	SS-09	L	3	3							X	ASTM D7979
.14	12/18/20	1525	MH-10E	L	3	3							X	low level Reporting
.15	12/18/20	—	SAN-DUP-121820	L	3	3							X	limit with estimated
.16	12/18/20	—	SS-DUP-121820	L	3	3							X	values

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 12/18/20	TIME 1545
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/18/20	TIME 15:45
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 12/18/20	TIME 16:55
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/18/2020	TIME 1655

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S22165.01(01)
Generated on 03/25/2021

Report to

Attention: Clifford Yantz
Ramboll Americas
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S22165.01-S22165.13
Project: RACER Coldwater Road
Collected Date(s): 03/11/2021
Submitted Date/Time: 03/11/2021 15:10
Sampled by: Kevin Schneider
P.O. #: 1940002628

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (13 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S22165.01	Field Blank-031121	Liquid	03/11/21 10:02
S22165.02	SAN-14	Liquid	03/11/21 10:04
S22165.03	SAN-12	Liquid	03/11/21 10:20
S22165.04	SAN-3	Liquid	03/11/21 10:33
S22165.05	SAN-10	Liquid	03/11/21 10:46
S22165.06	SAN-06	Liquid	03/11/21 10:58
S22165.07	SAN-DUP-031121	Liquid	03/11/21 00:01
S22165.08	MH-10E	Liquid	03/11/21 11:50
S22165.09	MH-17A	Liquid	03/11/21 12:48
S22165.10	SS-07	Liquid	03/11/21 13:03
S22165.11	SS-06	Liquid	03/11/21 13:21
S22165.12	MH-18	Liquid	03/11/21 13:38
S22165.13	SS-DUP-031121	Liquid	03/11/21 00:01

Analytical Laboratory Report

Lab Sample ID: S22165.01
Sample Tag: Field Blank-031121
Collected Date/Time: 03/11/2021 10:02
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.84/6.88/10	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/12/21 22:08, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.02	375-22-4	
PFPeA*	Not detected	4.0	1.0	ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.02	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	2.02	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	2.02	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.02	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.02	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2.02	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	2.02	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	2.02	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.02	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.02	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2.02	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	2.02	2991-50-6	
PFOS*	Not detected	2.0	2.0	ng/L	2.02	1763-23-1	
PFOS-LN*	Not detected	2.0	2.0	ng/L	2.02	1763-23-1-LN	
PFOS-BR*	Not detected	2.0	2.0	ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.02	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.02	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.02	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.02	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.02	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.02	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	2.02	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.02	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.02	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.02	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.02	13252-13-6	

Lab Sample ID: S22165.02
Sample Tag: SAN-14
Collected Date/Time: 03/11/2021 10:04
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.62/6.96/12	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/12/21 22:28, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.12	375-22-4	
PFPeA*	11	4.2	1.1	ng/L	2.12	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.12	757124-72-4	
PFHxA*	8.0	2.1	1.5	ng/L	2.12	307-24-4	
PFBS*	10.0	2.1	1.5	ng/L	2.12	375-73-5	
PFHpA*	5.5	2.1	1.5	ng/L	2.12	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.12	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.12	27619-97-2	
PFOA*	12	2.1	1.7	ng/L	2.12	335-67-1	
PFHxS*	4.6	2.1	1.7	ng/L	2.12	355-46-4	
PFHxS-LN*	3.4	2.1	1.7	ng/L	2.12	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.12	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.12	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.12	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.12	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.12	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.12	2355-31-9	
EtFOSAA*	Not detected	4.2	2.1	ng/L	2.12	2991-50-6	
PFOS*	40	2.1	2.1	ng/L	2.12	1763-23-1	
PFOS-LN*	17	2.1	2.1	ng/L	2.12	1763-23-1-LN	
PFOS-BR*	23	2.1	2.1	ng/L	2.12	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.12	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.12	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.12	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.12	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.12	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.12	754-91-6	
PFTeDA*	Not detected	4.2	1.9	ng/L	2.12	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.12	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.12	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.12	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.12	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S22165.03
Sample Tag: SAN-12
Collected Date/Time: 03/11/2021 10:20
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.72/6.85/12	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/15/21 14:34, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.04	375-22-4	
PFPeA*	7.3	4.1	1.0	ng/L	2.04	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.04	757124-72-4	
PFHxA*	5.6	2.0	1.4	ng/L	2.04	307-24-4	
PFBS*	5.6	2.0	1.4	ng/L	2.04	375-73-5	
PFHpA*	1.9	2.0	1.4	ng/L	2.04	375-85-9	J
PFPeS*	Not detected	2.0	1.8	ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.04	27619-97-2	
PFOA*	5.0	2.0	1.6	ng/L	2.04	335-67-1	
PFHxS*	5.6	2.0	1.6	ng/L	2.04	355-46-4	
PFHxS-LN*	3.6	2.0	1.6	ng/L	2.04	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.04	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.04	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2.04	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.04	2991-50-6	
PFOS*	48	2.0	2.0	ng/L	2.04	1763-23-1	
PFOS-LN*	24	2.0	2.0	ng/L	2.04	1763-23-1-LN	
PFOS-BR*	22	2.0	2.0	ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.04	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.04	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.04	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.04	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.04	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.04	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.04	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.04	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Lab Sample ID: S22165.04
Sample Tag: SAN-3
Collected Date/Time: 03/11/2021 10:33
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.46/7.05/11	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/12/21 23:46, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.03	375-22-4	
PFPeA*	1.8	4.1	1.0	ng/L	2.03	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.03	757124-72-4	
PFHxA*	1.8	2.0	1.4	ng/L	2.03	307-24-4	J
PFBS*	8.3	2.0	1.4	ng/L	2.03	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.03	375-85-9	
PFPeS*	9.4	2.0	1.8	ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.03	27619-97-2	
PFOA*	3.5	2.0	1.6	ng/L	2.03	335-67-1	
PFHxS*	42	2.0	1.6	ng/L	2.03	355-46-4	
PFHxS-LN*	35	2.0	1.6	ng/L	2.03	355-46-4-LN	
PFHxS-BR*	6.5	2.0	1.6	ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.03	39108-34-4	
PFHpS*	4.4	2.0	2.0	ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.03	2991-50-6	
PFOS*	96	2.0	2.0	ng/L	2.03	1763-23-1	
PFOS-LN*	17	2.0	2.0	ng/L	2.03	1763-23-1-LN	
PFOS-BR*	79	2.0	2.0	ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.03	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.03	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.03	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S22165.05
Sample Tag: SAN-10
Collected Date/Time: 03/11/2021 10:46
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.18/7.05/11	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/13/21 00:05, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.14	375-22-4	
PFPeA*	2.2	4.3	1.1	ng/L	2.14	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.14	757124-72-4	
PFHxA*	1.6	2.1	1.5	ng/L	2.14	307-24-4	J
PFBS*	6.2	2.1	1.5	ng/L	2.14	375-73-5	
PFHpA*	Not detected	2.1	1.5	ng/L	2.14	375-85-9	
PFPeS*	4.1	2.1	1.9	ng/L	2.14	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.14	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.14	335-67-1	
PFHxS*	13	2.1	1.7	ng/L	2.14	355-46-4	
PFHxS-LN*	11	2.1	1.7	ng/L	2.14	355-46-4-LN	
PFHxS-BR*	2.4	2.1	1.7	ng/L	2.14	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.14	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.14	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.14	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.14	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.14	2355-31-9	
EtFOSAA*	Not detected	4.3	2.1	ng/L	2.14	2991-50-6	
PFOS*	43	2.1	2.1	ng/L	2.14	1763-23-1	
PFOS-LN*	7.2	2.1	2.1	ng/L	2.14	1763-23-1-LN	
PFOS-BR*	34	2.1	2.1	ng/L	2.14	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.14	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.14	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.14	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.14	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.14	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.14	754-91-6	
PFTeDA*	Not detected	4.3	1.9	ng/L	2.14	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.14	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.14	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.14	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.14	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S22165.06
Sample Tag: SAN-06
Collected Date/Time: 03/11/2021 10:58
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.76/7.08/12	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/13/21 00:25, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.11	375-22-4	
PFPeA*	1.9	4.2	1.1	ng/L	2.11	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.11	757124-72-4	
PFHxA*	1.9	2.1	1.5	ng/L	2.11	307-24-4	J
PFBS*	4.5	2.1	1.5	ng/L	2.11	375-73-5	
PFHpA*	Not detected	2.1	1.5	ng/L	2.11	375-85-9	
PFPeS*	2.3	2.1	1.9	ng/L	2.11	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.11	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.11	335-67-1	
PFHxS*	10	2.1	1.7	ng/L	2.11	355-46-4	
PFHxS-LN*	8.1	2.1	1.7	ng/L	2.11	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.11	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.11	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.11	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.11	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.11	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.11	2355-31-9	
EtFOSAA*	Not detected	4.2	2.1	ng/L	2.11	2991-50-6	
PFOS*	34	2.1	2.1	ng/L	2.11	1763-23-1	
PFOS-LN*	5.7	2.1	2.1	ng/L	2.11	1763-23-1-LN	
PFOS-BR*	27	2.1	2.1	ng/L	2.11	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.11	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.11	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.11	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.11	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.11	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.11	754-91-6	
PFTeDA*	Not detected	4.2	1.9	ng/L	2.11	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.11	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.11	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.11	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.11	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S22165.07
Sample Tag: SAN-DUP-031121
Collected Date/Time: 03/11/2021 00:01
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.42/7.04/11	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/13/21 00:44, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.04	375-22-4	
PFPeA*	1.8	4.1	1.0	ng/L	2.04	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.04	757124-72-4	
PFHxA*	1.7	2.0	1.4	ng/L	2.04	307-24-4	J
PFBS*	6.9	2.0	1.4	ng/L	2.04	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.04	375-85-9	
PFPeS*	5.0	2.0	1.8	ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.04	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2.04	335-67-1	
PFHxS*	15	2.0	1.6	ng/L	2.04	355-46-4	
PFHxS-LN*	11	2.0	1.6	ng/L	2.04	355-46-4-LN	
PFHxS-BR*	3.2	2.0	1.6	ng/L	2.04	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.04	39108-34-4	
PFHpS*	2.3	2.0	2.0	ng/L	2.04	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.04	2991-50-6	
PFOS*	45	2.0	2.0	ng/L	2.04	1763-23-1	
PFOS-LN*	8.2	2.0	2.0	ng/L	2.04	1763-23-1-LN	
PFOS-BR*	36	2.0	2.0	ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.04	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.04	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.04	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.04	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.04	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.04	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.04	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	2.04	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S22165.11
Sample Tag: SS-06
Collected Date/Time: 03/11/2021 13:21
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.38/7.07/11	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/13/21 02:02, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.07	375-22-4	
PFPeA*	1.4	4.1	1.0	ng/L	2.07	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.07	757124-72-4	
PFHxA*	Not detected	2.1	1.4	ng/L	2.07	307-24-4	
PFBS*	3.3	2.1	1.4	ng/L	2.07	375-73-5	
PFHpA*	Not detected	2.1	1.4	ng/L	2.07	375-85-9	
PFPeS*	3.2	2.1	1.9	ng/L	2.07	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.07	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.07	335-67-1	
PFHxS*	9.3	2.1	1.7	ng/L	2.07	355-46-4	
PFHxS-LN*	7.3	2.1	1.7	ng/L	2.07	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.07	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.07	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.07	39108-34-4	
PFHpS*	2.2	2.1	2.1	ng/L	2.07	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.07	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.07	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.07	2991-50-6	
PFOS*	180	2.1	2.0	ng/L	2.07	1763-23-1	
PFOS-LN*	88	2.1	2.0	ng/L	2.07	1763-23-1-LN	
PFOS-BR*	86	2.1	2.0	ng/L	2.07	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.07	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.07	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.07	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.07	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.07	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.07	754-91-6	
PFTeDA*	Not detected	4.1	1.9	ng/L	2.07	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.07	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.07	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.07	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.07	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S22165.12
Sample Tag: MH-18
Collected Date/Time: 03/11/2021 13:38
Matrix: Liquid
COC Reference: 125037

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.64/7.06/11	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/13/21 02:22, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.9	9.9	ng/L	1.97	375-22-4	
PFPeA*	Not detected	3.9	0.99	ng/L	1.97	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.97	757124-72-4	
PFHxA*	1.9	2.0	1.4	ng/L	1.97	307-24-4	J
PFBS*	6.8	2.0	1.4	ng/L	1.97	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.97	375-85-9	
PFPeS*	14	2.0	1.8	ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.97	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.97	335-67-1	
PFHxS*	40	2.0	1.6	ng/L	1.97	355-46-4	
PFHxS-LN*	31	2.0	1.6	ng/L	1.97	355-46-4-LN	
PFHxS-BR*	7.9	2.0	1.6	ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.97	39108-34-4	
PFHpS*	5.5	2.0	2.0	ng/L	1.97	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.97	2991-50-6	
PFOS*	280	2.0	1.9	ng/L	1.97	1763-23-1	
PFOS-LN*	130	2.0	1.9	ng/L	1.97	1763-23-1-LN	
PFOS-BR*	140	2.0	1.9	ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.97	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.97	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.97	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.97	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.97	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.97	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.97	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.97	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.97	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.97	919005-14-4	
HFPO-DA*	Not detected	2.0	2.0	ng/L	1.97	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S22165.13
Sample Tag: SS-DUP-031121
Collected Date/Time: 03/11/2021 00:01
Matrix: Liquid
COC Reference: 141923

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.36/7.11/11	ASTMD7979-19M	03/12/21 13:45	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/13/21 02:41, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.1	375-22-4	
PFPeA*	1.9	4.2	1.1	ng/L	2.1	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.1	757124-72-4	
PFHxA*	1.5	2.1	1.5	ng/L	2.1	307-24-4	J
PFBS*	3.4	2.1	1.5	ng/L	2.1	375-73-5	
PFHpA*	Not detected	2.1	1.5	ng/L	2.1	375-85-9	
PFPeS*	2.2	2.1	1.9	ng/L	2.1	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.1	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.1	335-67-1	
PFHxS*	9.4	2.1	1.7	ng/L	2.1	355-46-4	
PFHxS-LN*	7.3	2.1	1.7	ng/L	2.1	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.1	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.1	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.1	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.1	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.1	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.1	2355-31-9	
EtFOSAA*	Not detected	4.2	2.1	ng/L	2.1	2991-50-6	
PFOS*	160	2.1	2.1	ng/L	2.1	1763-23-1	
PFOS-LN*	81	2.1	2.1	ng/L	2.1	1763-23-1-LN	
PFOS-BR*	76	2.1	2.1	ng/L	2.1	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.1	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.1	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.1	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.1	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.1	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.1	754-91-6	
PFTeDA*	Not detected	4.2	1.9	ng/L	2.1	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.1	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.1	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.1	919005-14-4	
HFPO-DA*	Not detected	2.1	2.1	ng/L	2.1	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Merit Laboratories Login Checklist

Lab Set ID: S22165
Client: OBG02 (Ramboll Americas - East Lansing, MI)
Project: RACER Coldwater Road
Submitted: 03/11/2021 15:10 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

125037

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yuntz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Clifford.Yuntz@Ramboll.com / Kevin.Schneider@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (ASTM D7979)	Special Instructions
22165.01	3/11/21	1002	Field Blank-031121	L	1	1							X	ASTM D7979
.02	3/11/21	1004	SAN-14	L	3	3							X	low level Reporting
.03	3/11/21	1020	SAN-12	L	3	3							X	limit with estimated
.04	3/11/21	1033	SAN-3	L	3	3							X	values
.05	3/11/21	1046	SAN-10	L	3	3							X	
.06	3/11/21	1058	SAN-06	L	3	3							X	
.07	3/11/21	—	SAN-DUP-031121	L	3	3							X	
.08	3/11/21	1150	MH-10E	L	3	3							X	
.09	3/11/21	1248	MH-17A	L	3	3							X	
.10	3/11/21	1303	SS-07	L	3	3							X	
.11	3/11/21	1321	SS-06	L	3	3							X	
.12	3/11/21	1378	MH-18	L	3	3							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	X Sampler	DATE 3/11/21	TIME 1420
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 3/11/21	TIME 1420
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 3/11/21	TIME 1520
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 3/11/21	TIME 1510

RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS
SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS

NOTES: TEMP. ON ARRIVAL 2.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.
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C.O.C. PAGE # 2 OF 2

141923

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider X

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (ASTM D 7979)	Special Instructions
22165.13	3/11/21	—	SS-DUP-031121	L	3	3							X	low level Reporting limit with estimated values

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	X Sampler	3/11/21	1420
RECEIVED BY: SIGNATURE/ORGANIZATION		3/11/21	1420
RELINQUISHED BY: SIGNATURE/ORGANIZATION		3/11/21	1510
RECEIVED BY: SIGNATURE/ORGANIZATION		3/11/21	1510

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S25784.01(01)
Generated on 07/14/2021

Report to

Attention: Clifford Yantz
Ramboll Americas
3600 Green Court Suite 750
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S25784.01-S25784.04
Project: RACER Coldwater Road
Collected Date(s): 06/29/2021
Submitted Date/Time: 06/29/2021 15:45
Sampled by: Kevin Schneider
P.O. #: 1940002628 (TASK 37)

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S25784.01	Field Blank - 062921	Liquid	06/29/21 12:24
S25784.02	SS-06	Liquid	06/29/21 12:26
S25784.03	SS-07	Liquid	06/29/21 12:32
S25784.04	MH-18	Liquid	06/29/21 12:40

Analytical Laboratory Report

Lab Sample ID: S25784.01
Sample Tag: Field Blank - 062921
Collected Date/Time: 06/29/2021 12:24
Matrix: Liquid
COC Reference: 107580

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.91/6.92/10	ASTMD7979-19M	06/30/21 20:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/08/21 08:36, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2	375-22-4	
PFPeA*	Not detected	4.0	1.0	ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	2	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	2	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	4.0	2.0	ng/L	2	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	2	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	2	2991-50-6	
PFOS*	Not detected	2.0	2.0	ng/L	2	1763-23-1	
PFOS-LN*	Not detected	2.0	2.0	ng/L	2	1763-23-1-LN	
PFOS-BR*	Not detected	2.0	2.0	ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2	919005-14-4	
HFPO-DA*	Not detected	10	2.0	ng/L	2	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S25784.02
Sample Tag: SS-06
Collected Date/Time: 06/29/2021 12:26
Matrix: Liquid
COC Reference: 107580

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.24/7.04/11	ASTMD7979-19M	06/30/21 20:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/08/21 08:55, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.12	375-22-4	
PFPeA*	3.1	4.2	1.1	ng/L	2.12	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.12	757124-72-4	
PFHxA*	3.2	2.1	1.5	ng/L	2.12	307-24-4	
PFBS*	4.8	2.1	1.5	ng/L	2.12	375-73-5	
PFHpA*	Not detected	2.1	1.5	ng/L	2.12	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.12	2706-91-4	
6:2 FTSA*	Not detected	4.2	2.1	ng/L	2.12	27619-97-2	
PFOA*	2.0	2.1	1.7	ng/L	2.12	335-67-1	J
PFHxS*	2.9	2.1	1.7	ng/L	2.12	355-46-4	
PFHxS-LN*	2.1	2.1	1.7	ng/L	2.12	355-46-4-LN	J
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.12	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.12	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.12	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.12	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.12	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.12	2355-31-9	
EtFOSAA*	Not detected	4.2	2.1	ng/L	2.12	2991-50-6	
PFOS*	14	2.1	2.1	ng/L	2.12	1763-23-1	
PFOS-LN*	5.7	2.1	2.1	ng/L	2.12	1763-23-1-LN	
PFOS-BR*	8.5	2.1	2.1	ng/L	2.12	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.12	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.12	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.12	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.12	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.12	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.12	754-91-6	
PFTeDA*	Not detected	4.2	1.9	ng/L	2.12	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.12	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.12	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.12	919005-14-4	
HFPO-DA*	Not detected	11	2.1	ng/L	2.12	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S25784.04
Sample Tag: MH-18
Collected Date/Time: 06/29/2021 12:40
Matrix: Liquid
COC Reference: 107580

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.59/7.01/11	ASTMD7979-19M	06/30/21 20:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/08/21 10:13, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	15	9.9	9.9	ng/L	1.97	375-22-4	
PFPeA*	2.4	3.9	0.99	ng/L	1.97	2706-90-3	J
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.97	757124-72-4	
PFHxA*	2.7	2.0	1.4	ng/L	1.97	307-24-4	
PFBS*	6.3	2.0	1.4	ng/L	1.97	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.97	375-85-9	
PFPeS*	13	2.0	1.8	ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	3.9	2.0	ng/L	1.97	27619-97-2	
PFOA*	3.7	2.0	1.6	ng/L	1.97	335-67-1	
PFHxS*	30	2.0	1.6	ng/L	1.97	355-46-4	
PFHxS-LN*	24	2.0	1.6	ng/L	1.97	355-46-4-LN	
PFHxS-BR*	5.3	2.0	1.6	ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.97	39108-34-4	
PFHpS*	4.8	2.0	2.0	ng/L	1.97	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.97	2991-50-6	
PFOS*	310	2.0	1.9	ng/L	1.97	1763-23-1	
PFOS-LN*	180	2.0	1.9	ng/L	1.97	1763-23-1-LN	
PFOS-BR*	130	2.0	1.9	ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.97	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.97	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.97	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.97	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.97	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.97	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.97	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.97	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.97	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.97	919005-14-4	
HFPO-DA*	Not detected	9.9	2.0	ng/L	1.97	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Merit Laboratories Login Checklist

Lab Set ID: S25784
Client: OBG02 (Ramboll Americas)
Project: RACER Coldwater Road
Submitted: 06/29/2021 15:45 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
3600 Green Court Suite 750
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

107580

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yeatts / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 3600 Green Court Ste 750
CITY: Ann Arbor STATE: MI ZIP CODE: 48105
PHONE NO.: 313-333-0211 FAX NO.:
P.O. NO.: 1940002628 (Task 37)
E-MAIL ADDRESS: Clifford.Yeatts@Ramboll.com / Kevin.Schneider@Ramboll.com
QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (1979)	Special Instructions
25784.01	6/29/21	1224	Field Blank-062921	L	1	X							X	Low level reporting with estimated values
.02	↓	1226	SS-06	L	3	X							X	
.03		1232	SS-07	L	3	X							X	
.04		1240	MH-18	L	3	X							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	X Sampler	DATE 6/29/21	TIME 1715
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/29/21	TIME 1735
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 6/29/21	TIME 1549
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/29/21	TIME 1845

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S34506.01(01)
Generated on 04/22/2022

Report to

Attention: Clifford Yantz
Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S34506.01-S34506.09
Project: RACER Cold Water Road
Collected Date(s): 03/31/2022
Submitted Date/Time: 04/01/2022 15:05
Sampled by: Kevin Schneider
P.O. #: 1940002628 (TASK 37)

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Sample Summary (9 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S34506.01	II-07CO16	Liquid	03/31/22 10:25
S34506.02	San-2	Liquid	03/31/22 10:40
S34506.03	San-06	Liquid	03/31/22 11:18
S34506.04	San-08	Liquid	03/31/22 10:08
S34506.05	San-09	Liquid	03/31/22 16:57
S34506.06	San-12	Liquid	03/31/22 11:42
S34506.07	San-14	Liquid	03/31/22 11:56
S34506.08	San-DUP-033122	Liquid	03/31/22 00:01
S34506.09	Field Blank-033122	Liquid	03/31/22 12:50

Analytical Laboratory Report

Lab Sample ID: S34506.03
Sample Tag: San-06
Collected Date/Time: 03/31/2022 11:18
Matrix: Liquid
COC Reference: 107571

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.83/6.99/12	ASTMD7979-19M	04/12/22 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/13/22 21:09, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.05	375-22-4	
PFPeA*	3.2	4.1	1.0	ng/L	2.05	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.6	ng/L	2.05	757124-72-4	
PFHxA*	3.1	2.1	1.4	ng/L	2.05	307-24-4	
PFBS*	11	2.1	1.4	ng/L	2.05	375-73-5	
PFHpA*	Not detected	2.1	1.4	ng/L	2.05	375-85-9	
PFPeS*	6.7	2.1	1.8	ng/L	2.05	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.05	27619-97-2	
PFOA*	2.7	2.1	1.6	ng/L	2.05	335-67-1	
PFHxS*	18	2.1	1.6	ng/L	2.05	355-46-4	
PFHxS-LN*	14	2.1	1.6	ng/L	2.05	355-46-4-LN	
PFHxS-BR*	3.7	2.1	1.6	ng/L	2.05	355-46-4-BR	
PFNA*	Not detected	2.1	1.8	ng/L	2.05	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.05	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.05	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.05	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.05	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.05	2991-50-6	
PFOS*	38	2.1	2.0	ng/L	2.05	1763-23-1	
PFOS-LN*	5.7	2.1	2.0	ng/L	2.05	1763-23-1-LN	
PFOS-BR*	31	2.1	2.0	ng/L	2.05	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.05	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.05	68259-12-1	
PFDoDA*	Not detected	2.1	1.6	ng/L	2.05	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.05	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.05	72629-94-8	
FOSA*	Not detected	2.1	1.8	ng/L	2.05	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.05	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.8	ng/L	2.05	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.05	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.05	919005-14-4	
HFPO-DA*	Not detected	4.1	2.1	ng/L	2.05	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S34506.06
Sample Tag: San-12
Collected Date/Time: 03/31/2022 11:42
Matrix: Liquid
COC Reference: 107571

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.86/7.06/12	ASTMD7979-19M	04/12/22 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/13/22 22:08, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.07	375-22-4	
PFPeA*	7.1	4.1	1.0	ng/L	2.07	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.07	757124-72-4	
PFHxA*	6.0	2.1	1.4	ng/L	2.07	307-24-4	
PFBS*	8.4	2.1	1.4	ng/L	2.07	375-73-5	
PFHpA*	2.0	2.1	1.4	ng/L	2.07	375-85-9	J
PFPeS*	5.0	2.1	1.9	ng/L	2.07	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.07	27619-97-2	
PFOA*	7.0	2.1	1.7	ng/L	2.07	335-67-1	
PFHxS*	22	2.1	1.7	ng/L	2.07	355-46-4	
PFHxS-LN*	18	2.1	1.7	ng/L	2.07	355-46-4-LN	
PFHxS-BR*	3.5	2.1	1.7	ng/L	2.07	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.07	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.07	39108-34-4	
PFHpS*	4.8	2.1	2.1	ng/L	2.07	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.07	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.07	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.07	2991-50-6	
PFOS*	120	2.1	2.0	ng/L	2.07	1763-23-1	
PFOS-LN*	50	2.1	2.0	ng/L	2.07	1763-23-1-LN	
PFOS-BR*	69	2.1	2.0	ng/L	2.07	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.07	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.07	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.07	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.07	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.07	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.07	754-91-6	
PFTeDA*	Not detected	4.1	1.9	ng/L	2.07	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.07	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.07	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.07	919005-14-4	
HFPO-DA*	Not detected	4.1	2.1	ng/L	2.07	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S34506.07
Sample Tag: San-14
Collected Date/Time: 03/31/2022 11:56
Matrix: Liquid
COC Reference: 107571

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.60/6.92/12	ASTMD7979-19M	04/12/22 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/13/22 22:27, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.11	375-22-4	
PFPeA*	3.2	4.2	1.1	ng/L	2.11	2706-90-3	J
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.11	757124-72-4	
PFHxA*	2.8	2.1	1.5	ng/L	2.11	307-24-4	
PFBS*	7.6	2.1	1.5	ng/L	2.11	375-73-5	
PFHpA*	1.6	2.1	1.5	ng/L	2.11	375-85-9	J
PFPeS*	Not detected	2.1	1.9	ng/L	2.11	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.11	27619-97-2	
PFOA*	4.7	2.1	1.7	ng/L	2.11	335-67-1	
PFHxS*	3.0	2.1	1.7	ng/L	2.11	355-46-4	
PFHxS-LN*	2.1	2.1	1.7	ng/L	2.11	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.11	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.11	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.11	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.11	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.11	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.11	2355-31-9	
EtFOSAA*	Not detected	4.2	2.1	ng/L	2.11	2991-50-6	
PFOS*	15	2.1	2.1	ng/L	2.11	1763-23-1	
PFOS-LN*	3.7	2.1	2.1	ng/L	2.11	1763-23-1-LN	
PFOS-BR*	11	2.1	2.1	ng/L	2.11	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.11	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.11	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.11	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.11	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.11	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.11	754-91-6	
PFTeDA*	Not detected	4.2	1.9	ng/L	2.11	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.11	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.11	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.11	919005-14-4	
HFPO-DA*	Not detected	4.2	2.1	ng/L	2.11	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S34506.09
Sample Tag: Field Blank-033122
Collected Date/Time: 03/31/2022 12:50
Matrix: Liquid
COC Reference: 107571

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.36/7.01/9	ASTMD7979-19M	04/12/22 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/13/22 23:06, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.07	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.07	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.07	757124-72-4	
PFHxA*	Not detected	2.1	1.4	ng/L	2.07	307-24-4	
PFBS*	Not detected	2.1	1.4	ng/L	2.07	375-73-5	
PFHpA*	Not detected	2.1	1.4	ng/L	2.07	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.07	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.07	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.07	335-67-1	
PFHxS*	Not detected	2.1	1.7	ng/L	2.07	355-46-4	
PFHxS-LN*	Not detected	2.1	1.7	ng/L	2.07	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.07	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.07	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.07	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.07	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.07	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.07	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.07	2991-50-6	
PFOS*	Not detected	2.1	2.0	ng/L	2.07	1763-23-1	
PFOS-LN*	Not detected	2.1	2.0	ng/L	2.07	1763-23-1-LN	
PFOS-BR*	Not detected	2.1	2.0	ng/L	2.07	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.07	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.07	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.07	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.07	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.07	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.07	754-91-6	
PFTeDA*	Not detected	4.1	1.9	ng/L	2.07	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.07	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.07	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.07	919005-14-4	
HFPO-DA*	Not detected	4.1	2.1	ng/L	2.07	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S34506
Client: OBG02 (Ramboll Americas)
Project: RACER Cold Water Road
Submitted: 04/01/2022 15:05 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.6
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

107571

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2098 Commonwealth Blvd.
CITY: Ann Arbor | STATE: MI | ZIP CODE: 48105
PHONE NO.: 313-333-0211 | FAX NO.: | P.O. NO.: 1940026028 Task 37
E-MAIL ADDRESS: Clifford.Yantz@ramboll.com Kevin.Schneider@Ramboll.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: | ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Cold Water Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS 7976	Special Instructions
34506.01	3/31/22	10:25	II-076016	L	3	X							X	Low Level Reporting
.02	3/31/22	10:40	San-2	L	3	X							X	limit with
.03	3/31/22	11:18	San-06	L	3	X							X	estimated values
.04	3/31/22	10:08	San-08	L	3	X							X	
.05	3/31/22	10:57	San-09	L	3	X							X	
.06	3/31/22	11:42	San-12	L	3	X							X	
.07	3/31/22	11:56	San-14	L	3	X							X	
.08	3/31/22	—	San-DUP-033122	L	3	X							X	
.09	3/31/22	12:50	Field Blank-033122	L	1	X							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 4/1/22	TIME 12:15
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 4/1/22	TIME 12:15
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 4/1/22	TIME 15:05
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 4/1/22	TIME 1505

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 4.6

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S40036.01(01)
Generated on 09/30/2022

Report to

Attention: Clifford Yantz
Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S40036.01-S40036.05
Project: RACER Coldwater Rd
Collected Date(s): 09/07/2022
Submitted Date/Time: 09/07/2022 14:15
Sampled by: Kevin Schneider
P.O. #: 1940002628 TASK 37

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S40036.01	SS-10	Liquid	09/07/22 09:56
S40036.02	San-06	Liquid	09/07/22 10:08
S40036.03	San-12	Liquid	09/07/22 10:20
S40036.04	San-14	Liquid	09/07/22 10:30
S40036.05	Field Blank-090722	Liquid	09/07/22 08:50

Analytical Laboratory Report

Lab Sample ID: S40036.01
Sample Tag: SS-10
Collected Date/Time: 09/07/2022 09:56
Matrix: Liquid
COC Reference: 144820

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.77/6.98/12	ASTMD7979-19M	09/26/22 11:45	WTS	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/26/22 20:45, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	11	10	10	ng/L	2.07	375-22-4	
PFPeA*	7.9	4.1	1.0	ng/L	2.07	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.07	757124-72-4	
PFHxA*	7.2	2.1	1.4	ng/L	2.07	307-24-4	
PFBS*	23	2.1	1.4	ng/L	2.07	375-73-5	
PFHpA*	5.1	2.1	1.4	ng/L	2.07	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.07	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.07	27619-97-2	
PFOA*	9.7	2.1	1.7	ng/L	2.07	335-67-1	
PFHxS*	4.2	2.1	1.7	ng/L	2.07	355-46-4	
PFHxS-LN*	3.0	2.1	1.7	ng/L	2.07	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.07	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.07	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.07	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.07	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.07	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.07	2355-31-9	
EtFOSAA*	Not detected	4.1	2.1	ng/L	2.07	2991-50-6	
PFOS*	17	2.1	2.0	ng/L	2.07	1763-23-1	
PFOS-LN*	3.8	2.1	2.0	ng/L	2.07	1763-23-1-LN	
PFOS-BR*	13	2.1	2.0	ng/L	2.07	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.4	ng/L	2.07	2058-94-8	
PFNS*	Not detected	2.1	1.4	ng/L	2.07	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.07	307-55-1	
PFDS*	Not detected	2.1	1.4	ng/L	2.07	335-77-3	
PFTrDA*	Not detected	2.1	1.2	ng/L	2.07	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.07	754-91-6	
PFTeDA*	Not detected	4.1	1.9	ng/L	2.07	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.07	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.4	ng/L	2.07	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.07	919005-14-4	
HFPO-DA*	Not detected	10	2.1	ng/L	2.07	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S40036.02
Sample Tag: San-06
Collected Date/Time: 09/07/2022 10:08
Matrix: Liquid
COC Reference: 144820

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.56/7.12/11	ASTMD7979-19M	09/26/22 11:45	WTS	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/26/22 21:05, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.02	375-22-4	
PFPeA*	Not detected	4.0	1.0	ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.02	757124-72-4	I
PFHxA*	3.4	2.0	1.4	ng/L	2.02	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	2.02	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.02	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.02	27619-97-2	I
PFOA*	Not detected	2.0	1.6	ng/L	2.02	335-67-1	
PFHxS*	5.6	2.0	1.6	ng/L	2.02	355-46-4	
PFHxS-LN*	2.5	2.0	1.6	ng/L	2.02	355-46-4-LN	
PFHxS-BR*	2.7	2.0	1.6	ng/L	2.02	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.02	39108-34-4	I
PFHpS*	Not detected	2.0	2.0	ng/L	2.02	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	4.0	2.0	ng/L	2.02	2991-50-6	
PFOS*	13	2.0	2.0	ng/L	2.02	1763-23-1	
PFOS-LN*	3.6	2.0	2.0	ng/L	2.02	1763-23-1-LN	
PFOS-BR*	9.1	2.0	2.0	ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.02	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.02	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.02	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.02	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.02	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.02	754-91-6	
PFTeDA*	Not detected	4.0	1.8	ng/L	2.02	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.02	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.02	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.02	919005-14-4	
HFPO-DA*	Not detected	10	2.0	ng/L	2.02	13252-13-6	

I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S40036.03
Sample Tag: San-12
Collected Date/Time: 09/07/2022 10:20
Matrix: Liquid
COC Reference: 144820

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.97/7.07/12	ASTMD7979-19M	09/26/22 11:45	WTS	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/26/22 21:24, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.03	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.03	757124-72-4	
PFHxA*	1.6	2.0	1.4	ng/L	2.03	307-24-4	J
PFBS*	Not detected	2.0	1.4	ng/L	2.03	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.03	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.03	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2.03	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	2.03	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	2.03	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.03	39108-34-4	I
PFHpS*	Not detected	2.0	2.0	ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.03	2991-50-6	
PFOS*	19	2.0	2.0	ng/L	2.03	1763-23-1	
PFOS-LN*	12	2.0	2.0	ng/L	2.03	1763-23-1-LN	
PFOS-BR*	4.8	2.0	2.0	ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.03	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.03	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	10	2.0	ng/L	2.03	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL
I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S40036.04
Sample Tag: San-14
Collected Date/Time: 09/07/2022 10:30
Matrix: Liquid
COC Reference: 144820

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.68/7.06/12	ASTMD7979-19M	09/26/22 11:45	WTS	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/26/22 21:44, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.14	375-22-4	
PFPeA*	Not detected	4.3	1.1	ng/L	2.14	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.14	757124-72-4	
PFHxA*	2.5	2.1	1.5	ng/L	2.14	307-24-4	
PFBS*	2.5	2.1	1.5	ng/L	2.14	375-73-5	
PFHpA*	Not detected	2.1	1.5	ng/L	2.14	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.14	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.14	27619-97-2	
PFOA*	3.2	2.1	1.7	ng/L	2.14	335-67-1	
PFHxS*	3.3	2.1	1.7	ng/L	2.14	355-46-4	
PFHxS-LN*	2.4	2.1	1.7	ng/L	2.14	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.14	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.14	375-95-1	
8:2 FTSA*	Not detected	2.1	1.1	ng/L	2.14	39108-34-4	I
PFHpS*	Not detected	2.1	2.1	ng/L	2.14	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.14	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.14	2355-31-9	
EtFOSAA*	Not detected	4.3	2.1	ng/L	2.14	2991-50-6	
PFOS*	14	2.1	2.1	ng/L	2.14	1763-23-1	
PFOS-LN*	6.6	2.1	2.1	ng/L	2.14	1763-23-1-LN	
PFOS-BR*	8.1	2.1	2.1	ng/L	2.14	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.14	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.14	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.14	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.14	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.14	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.14	754-91-6	
PFTeDA*	Not detected	4.3	1.9	ng/L	2.14	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.14	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.14	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.14	919005-14-4	
HFPO-DA*	Not detected	11	2.1	ng/L	2.14	13252-13-6	

I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S40036.05
Sample Tag: Field Blank-090722
Collected Date/Time: 09/07/2022 08:50
Matrix: Liquid
COC Reference: 144819

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.36/7.10/11	ASTMD7979-19M	09/26/22 11:45	WTS	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 09/26/22 22:03, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.09	375-22-4	
PFPeA*	Not detected	4.2	1.0	ng/L	2.09	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.09	757124-72-4	
PFHxA*	Not detected	2.1	1.5	ng/L	2.09	307-24-4	
PFBS*	Not detected	2.1	1.5	ng/L	2.09	375-73-5	
PFHpA*	Not detected	2.1	1.5	ng/L	2.09	375-85-9	
PFPeS*	Not detected	2.1	1.9	ng/L	2.09	2706-91-4	
6:2 FTSA*	Not detected	2.1	2.1	ng/L	2.09	27619-97-2	
PFOA*	Not detected	2.1	1.7	ng/L	2.09	335-67-1	
PFHxS*	Not detected	2.1	1.7	ng/L	2.09	355-46-4	
PFHxS-LN*	Not detected	2.1	1.7	ng/L	2.09	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.09	355-46-4-BR	
PFNA*	Not detected	2.1	1.9	ng/L	2.09	375-95-1	
8:2 FTSA*	Not detected	2.1	1.0	ng/L	2.09	39108-34-4	I
PFHpS*	Not detected	2.1	2.1	ng/L	2.09	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.09	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.09	2355-31-9	
EtFOSAA*	Not detected	4.2	2.1	ng/L	2.09	2991-50-6	
PFOS*	Not detected	2.1	2.0	ng/L	2.09	1763-23-1	
PFOS-LN*	Not detected	2.1	2.0	ng/L	2.09	1763-23-1-LN	
PFOS-BR*	Not detected	2.1	2.0	ng/L	2.09	1763-23-1-BR	
PFUnDA*	Not detected	2.1	1.5	ng/L	2.09	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.09	68259-12-1	
PFDoDA*	Not detected	2.1	1.7	ng/L	2.09	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.09	335-77-3	
PFTrDA*	Not detected	2.1	1.3	ng/L	2.09	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.09	754-91-6	
PFTeDA*	Not detected	4.2	1.9	ng/L	2.09	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.09	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.09	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.09	919005-14-4	
HFPO-DA*	Not detected	10	2.1	ng/L	2.09	13252-13-6	

I-Matrix interference with internal standard

Merit Laboratories Login Checklist

Lab Set ID: S40036
Client: OBG02 (Ramboll Americas)
Project: RACER Coldwater Rd
Submitted: 09/07/2022 14:15 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.5
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

144820

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schreider
COMPANY: Ramboll
ADDRESS: 2090 Commonwealth Blvd.
CITY: Ann Arbor STATE: MI ZIP CODE: 48105
PHONE NO.: 313-333-0211 FAX NO.:
P.O. NO.: 1944002620 Task 37
E-MAIL ADDRESS: Clifford.Yantz@ramboll.com Kevin.Schreider@ramboll.com
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Cattaraster Rd
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schreider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS 24	Special Instructions
40036.01	9/1/22	9:50	SS-10	L	3	X							X	Please report
.02	9/1/22	10:08	San-06	L	3	X							X	sample "Field Blank-
.03	9/1/22	10:20	San-12	L	3	X							X	090122" from
.04	9/1/22	10:30	San-14	L	3	X							X	COC 144819. in
.05														same cooler
														Low level reporting
														limit with
														estimated values

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 9/1/22	TIME 1137
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 9/2/22	TIME 1137
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 9/7/22	TIME 14:15
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 9/7/22	TIME 1415

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.5

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.16.12

Analytical Laboratory Report

Report ID: S43403.01(01)
Generated on 01/17/2023

Report to

Attention: Clifford Yantz
Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

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Report Summary

Lab Sample ID(s): S43403.01-S43403.04
Project: RACER Coldwater Road
Collected Date(s): 12/13/2022
Submitted Date/Time: 12/13/2022 16:20
Sampled by: Kevin Schneider
P.O. #: 194002628 TASK 36

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S43403.01	SAN-06	Liquid	12/13/22 11:30
S43403.02	SAN-12	Liquid	12/13/22 11:43
S43403.03	SAN-14	Liquid	12/13/22 11:54
S43403.04	Field Blank-121322	Liquid	12/13/22 10:00

Analytical Laboratory Report

Lab Sample ID: S43403.01
Sample Tag: SAN-06
Collected Date/Time: 12/13/2022 11:30
Matrix: Liquid
COC Reference: 154983

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.28/6.51/11	ASTMD7979-19M	01/03/23 10:00	PTW	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 01/04/23 12:01, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.6	9.6	ng/L	1.91	375-22-4	
PFPeA*	Not detected	3.8	0.96	ng/L	1.91	2706-90-3	
4:2 FTSA*	Not detected	1.9	1.5	ng/L	1.91	757124-72-4	
PFHxA*	2.1	1.9	1.3	ng/L	1.91	307-24-4	
PFBS*	Not detected	1.9	1.3	ng/L	1.91	375-73-5	
PFHpA*	Not detected	1.9	1.3	ng/L	1.91	375-85-9	
PFPeS*	Not detected	1.9	1.7	ng/L	1.91	2706-91-4	
6:2 FTSA*	Not detected	1.9	1.9	ng/L	1.91	27619-97-2	
PFOA*	Not detected	1.9	1.5	ng/L	1.91	335-67-1	
PFHxS*	Not detected	1.9	1.5	ng/L	1.91	355-46-4	
PFHxS-LN*	Not detected	1.9	1.5	ng/L	1.91	355-46-4-LN	
PFHxS-BR*	Not detected	1.9	1.5	ng/L	1.91	355-46-4-BR	
PFNA*	Not detected	1.9	1.7	ng/L	1.91	375-95-1	
8:2 FTSA*	Not detected	1.9	0.96	ng/L	1.91	39108-34-4	
PFHpS*	Not detected	1.9	1.9	ng/L	1.91	375-92-8	
PFDA*	Not detected	1.9	1.9	ng/L	1.91	335-76-2	
N-MeFOSAA*	Not detected	1.9	1.9	ng/L	1.91	2355-31-9	
EtFOSAA*	Not detected	3.8	1.9	ng/L	1.91	2991-50-6	
PFOS*	4.5	1.9	1.9	ng/L	1.91	1763-23-1	
PFOS-LN*	2.0	1.9	1.9	ng/L	1.91	1763-23-1-LN	
PFOS-BR*	2.4	1.9	1.9	ng/L	1.91	1763-23-1-BR	
PFUnDA*	Not detected	1.9	1.3	ng/L	1.91	2058-94-8	
PFNS*	Not detected	1.9	1.3	ng/L	1.91	68259-12-1	
PFDoDA*	Not detected	1.9	1.5	ng/L	1.91	307-55-1	
PFDS*	Not detected	1.9	1.3	ng/L	1.91	335-77-3	
PFTrDA*	Not detected	1.9	1.1	ng/L	1.91	72629-94-8	
FOSA*	Not detected	1.9	1.7	ng/L	1.91	754-91-6	
PFTeDA*	Not detected	3.8	1.7	ng/L	1.91	376-06-7	
11Cl-PF3OUdS*	Not detected	1.9	1.7	ng/L	1.91	763051-92-9	
9Cl-PF3ONS*	Not detected	1.9	1.3	ng/L	1.91	756426-58-1	
ADONA*	Not detected	1.9	1.9	ng/L	1.91	919005-14-4	
HFPO-DA*	Not detected	9.6	1.9	ng/L	1.91	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S43403.02
Sample Tag: SAN-12
Collected Date/Time: 12/13/2022 11:43
Matrix: Liquid
COC Reference: 154983

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.66/6.53/10	ASTMD7979-19M	01/03/23 10:00	PTW	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 01/04/23 12:20, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.8	9.8	ng/L	1.95	375-22-4	
PFPeA*	14	3.9	0.98	ng/L	1.95	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.95	757124-72-4	
PFHxA*	12	2.0	1.4	ng/L	1.95	307-24-4	
PFBS*	2.0	2.0	1.4	ng/L	1.95	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.95	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.95	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.95	27619-97-2	
PFOA*	2.6	2.0	1.6	ng/L	1.95	335-67-1	
PFHxS*	2.3	2.0	1.6	ng/L	1.95	355-46-4	
PFHxS-LN*	1.7	2.0	1.6	ng/L	1.95	355-46-4-LN	J
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.95	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.95	375-95-1	
8:2 FTSA*	Not detected	2.0	0.98	ng/L	1.95	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.95	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.95	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.95	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.95	2991-50-6	
PFOS*	18	2.0	1.9	ng/L	1.95	1763-23-1	
PFOS-LN*	7.2	2.0	1.9	ng/L	1.95	1763-23-1-LN	
PFOS-BR*	10	2.0	1.9	ng/L	1.95	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.95	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.95	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.95	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.95	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.95	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.95	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.95	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.95	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.95	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.95	919005-14-4	
HFPO-DA*	Not detected	9.8	2.0	ng/L	1.95	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S43403.03
Sample Tag: SAN-14
Collected Date/Time: 12/13/2022 11:54
Matrix: Liquid
COC Reference: 154983

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.11/6.54/11	ASTMD7979-19M	01/03/23 10:00	PTW	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 01/04/23 12:40, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.9	9.9	ng/L	1.97	375-22-4	
PFPeA*	Not detected	3.9	0.99	ng/L	1.97	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	1.97	757124-72-4	
PFHxA*	1.5	2.0	1.4	ng/L	1.97	307-24-4	J
PFBS*	3.0	2.0	1.4	ng/L	1.97	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	1.97	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	1.97	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	1.97	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	1.97	335-67-1	
PFHxS*	4.0	2.0	1.6	ng/L	1.97	355-46-4	
PFHxS-LN*	2.6	2.0	1.6	ng/L	1.97	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	1.97	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	1.97	375-95-1	
8:2 FTSA*	Not detected	2.0	0.99	ng/L	1.97	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	1.97	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	1.97	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	1.97	2355-31-9	
EtFOSAA*	Not detected	3.9	2.0	ng/L	1.97	2991-50-6	
PFOS*	6.3	2.0	1.9	ng/L	1.97	1763-23-1	
PFOS-LN*	2.4	2.0	1.9	ng/L	1.97	1763-23-1-LN	
PFOS-BR*	3.8	2.0	1.9	ng/L	1.97	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	1.97	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	1.97	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	1.97	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	1.97	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	1.97	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	1.97	754-91-6	
PFTeDA*	Not detected	3.9	1.8	ng/L	1.97	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	1.97	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	1.97	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	1.97	919005-14-4	
HFPO-DA*	Not detected	9.9	2.0	ng/L	1.97	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Analytical Laboratory Report

Lab Sample ID: S43403.04
Sample Tag: Field Blank-121322
Collected Date/Time: 12/13/2022 10:00
Matrix: Liquid
COC Reference: 154983

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.45/6.53/10	ASTMD7979-19M	01/03/23 10:00	PTW	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 01/03/23 19:55, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	10	10	ng/L	2.03	375-22-4	
PFPeA*	Not detected	4.1	1.0	ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0	1.6	ng/L	2.03	757124-72-4	
PFHxA*	Not detected	2.0	1.4	ng/L	2.03	307-24-4	
PFBS*	Not detected	2.0	1.4	ng/L	2.03	375-73-5	
PFHpA*	Not detected	2.0	1.4	ng/L	2.03	375-85-9	
PFPeS*	Not detected	2.0	1.8	ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	2.0	2.0	ng/L	2.03	27619-97-2	
PFOA*	Not detected	2.0	1.6	ng/L	2.03	335-67-1	
PFHxS*	Not detected	2.0	1.6	ng/L	2.03	355-46-4	
PFHxS-LN*	Not detected	2.0	1.6	ng/L	2.03	355-46-4-LN	
PFHxS-BR*	Not detected	2.0	1.6	ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	2.0	1.8	ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0	1.0	ng/L	2.03	39108-34-4	
PFHpS*	Not detected	2.0	2.0	ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0	2.0	ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0	2.0	ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1	2.0	ng/L	2.03	2991-50-6	
PFOS*	Not detected	2.0	2.0	ng/L	2.03	1763-23-1	
PFOS-LN*	Not detected	2.0	2.0	ng/L	2.03	1763-23-1-LN	
PFOS-BR*	Not detected	2.0	2.0	ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0	1.4	ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0	1.4	ng/L	2.03	68259-12-1	
PFDoDA*	Not detected	2.0	1.6	ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0	1.4	ng/L	2.03	335-77-3	
PFTrDA*	Not detected	2.0	1.2	ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0	1.8	ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1	1.8	ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0	1.8	ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0	1.4	ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0	2.0	ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	10	2.0	ng/L	2.03	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S43403
Client: OBG02 (Ramboll Americas - East Lansing, MI)
Project: RACER Coldwater Road
Submitted: 12/13/2022 16:20 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

154983

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2090 Commonwealth Blvd
CITY: Ann Arbor STATE: MI ZIP CODE: 48105
PHONE NO.: 313-333-0211 CELL NO.: P.O. NO.: 1940026028 task 36
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com Kevin.Schneider@Ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG / IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS (m79)	Special Instructions
43403.01	12/13/22	1130	SAN-06	L	3	X							X	Low Level Reporting with estimated values
.02	↓	1143	SAN-12	L	3	X							X	
.03	↓	1154	SAN-14	L	3	X							X	
.04														Please Report Sample "Field Blank-121322" from COC # 154984 in same cooler

RELINQUISHED BY: SIGNATURE/ORGANIZATION	X Sampler	DATE 12/13/22	TIME 12:53
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/13/22	TIME 12:55
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 12/13/22	TIME 16:20
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/13/22	TIME 1620

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S43964.01(01)
Generated on 01/31/2023

Report to

Attention: Clifford Yantz
Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S43964.01-S43964.02
Project: RACER Coldwater Road
Collected Date(s): 01/04/2023
Submitted Date/Time: 01/04/2023 14:40
Sampled by: Kevin Schneider
P.O. #: 194002628 TASK 31

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Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S43964.01	SS-10	Liquid	01/04/23 12:56
S43964.02	Field Blank-010423	Liquid	01/04/23 13:00

Analytical Laboratory Report

Lab Sample ID: S43964.01
Sample Tag: SS-10
Collected Date/Time: 01/04/2023 12:56
Matrix: Liquid
COC Reference: 154988

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.71/6.53/10	ASTMD7979-19M	01/17/23 10:00	PTW	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 01/18/23 20:35, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	9.7	9.7	ng/L	1.93	375-22-4	
PFPeA*	Not detected	3.9	0.97	ng/L	1.93	2706-90-3	
4:2 FTSA*	Not detected	1.9	1.5	ng/L	1.93	757124-72-4	
PFHxA*	Not detected	1.9	1.4	ng/L	1.93	307-24-4	
PFBS*	Not detected	1.9	1.4	ng/L	1.93	375-73-5	
PFHpA*	Not detected	1.9	1.4	ng/L	1.93	375-85-9	
PFPeS*	Not detected	1.9	1.7	ng/L	1.93	2706-91-4	
6:2 FTSA*	Not detected	1.9	1.9	ng/L	1.93	27619-97-2	
PFOA*	Not detected	1.9	1.5	ng/L	1.93	335-67-1	
PFHxS*	Not detected	1.9	1.5	ng/L	1.93	355-46-4	
PFHxS-LN*	Not detected	1.9	1.5	ng/L	1.93	355-46-4-LN	
PFHxS-BR*	Not detected	1.9	1.5	ng/L	1.93	355-46-4-BR	
PFNA*	Not detected	1.9	1.7	ng/L	1.93	375-95-1	
8:2 FTSA*	Not detected	1.9	0.97	ng/L	1.93	39108-34-4	
PFHpS*	Not detected	1.9	1.9	ng/L	1.93	375-92-8	
PFDA*	Not detected	1.9	1.9	ng/L	1.93	335-76-2	
N-MeFOSAA*	Not detected	1.9	1.9	ng/L	1.93	2355-31-9	
EtFOSAA*	Not detected	3.9	1.9	ng/L	1.93	2991-50-6	
PFOS*	Not detected	1.9	1.9	ng/L	1.93	1763-23-1	
PFOS-LN*	Not detected	1.9	1.9	ng/L	1.93	1763-23-1-LN	
PFOS-BR*	Not detected	1.9	1.9	ng/L	1.93	1763-23-1-BR	
PFUnDA*	Not detected	1.9	1.4	ng/L	1.93	2058-94-8	
PFNS*	Not detected	1.9	1.4	ng/L	1.93	68259-12-1	
PFDoDA*	Not detected	1.9	1.5	ng/L	1.93	307-55-1	
PFDS*	Not detected	1.9	1.4	ng/L	1.93	335-77-3	
PFTrDA*	Not detected	1.9	1.2	ng/L	1.93	72629-94-8	
FOSA*	Not detected	1.9	1.7	ng/L	1.93	754-91-6	
PFTeDA*	Not detected	3.9	1.7	ng/L	1.93	376-06-7	
11Cl-PF3OUdS*	Not detected	1.9	1.7	ng/L	1.93	763051-92-9	
9Cl-PF3ONS*	Not detected	1.9	1.4	ng/L	1.93	756426-58-1	
ADONA*	Not detected	1.9	1.9	ng/L	1.93	919005-14-4	
HFPO-DA*	Not detected	9.7	1.9	ng/L	1.93	13252-13-6	

Analytical Laboratory Report

Lab Sample ID: S43964.02
Sample Tag: Field Blank-010423
Collected Date/Time: 01/04/2023 13:00
Matrix: Liquid
COC Reference: 154988

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.22/6.54/10	ASTMD7979-19M	01/17/23 10:00	PTW	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 01/18/23 20:16, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11	11	ng/L	2.14	375-22-4	
PFPeA*	Not detected	4.3	1.1	ng/L	2.14	2706-90-3	
4:2 FTSA*	Not detected	2.1	1.7	ng/L	2.14	757124-72-4	
PFHxA*	Not detected	2.1	1.5	ng/L	2.14	307-24-4	
PFBS*	Not detected	2.1	1.5	ng/L	2.14	375-73-5	
PFHpA*	1.6	2.1	1.5	ng/L	2.14	375-85-9	J
PFPeS*	Not detected	2.1	1.9	ng/L	2.14	2706-91-4	
6:2 FTSA*	30	2.1	2.1	ng/L	2.14	27619-97-2	
PFOA*	2.2	2.1	1.7	ng/L	2.14	335-67-1	
PFHxS*	Not detected	2.1	1.7	ng/L	2.14	355-46-4	
PFHxS-LN*	Not detected	2.1	1.7	ng/L	2.14	355-46-4-LN	
PFHxS-BR*	Not detected	2.1	1.7	ng/L	2.14	355-46-4-BR	
PFNA*	2.0	2.1	1.9	ng/L	2.14	375-95-1	J
8:2 FTSA*	32	2.1	1.1	ng/L	2.14	39108-34-4	
PFHpS*	Not detected	2.1	2.1	ng/L	2.14	375-92-8	
PFDA*	Not detected	2.1	2.1	ng/L	2.14	335-76-2	
N-MeFOSAA*	Not detected	2.1	2.1	ng/L	2.14	2355-31-9	
EtFOSAA*	Not detected	4.3	2.1	ng/L	2.14	2991-50-6	
PFOS*	Not detected	2.1	2.1	ng/L	2.14	1763-23-1	
PFOS-LN*	Not detected	2.1	2.1	ng/L	2.14	1763-23-1-LN	
PFOS-BR*	Not detected	2.1	2.1	ng/L	2.14	1763-23-1-BR	
PFUnDA*	2.6	2.1	1.5	ng/L	2.14	2058-94-8	
PFNS*	Not detected	2.1	1.5	ng/L	2.14	68259-12-1	
PFDoDA*	4.3	2.1	1.7	ng/L	2.14	307-55-1	
PFDS*	Not detected	2.1	1.5	ng/L	2.14	335-77-3	
PFTrDA*	2.2	2.1	1.3	ng/L	2.14	72629-94-8	
FOSA*	Not detected	2.1	1.9	ng/L	2.14	754-91-6	
PFTeDA*	3.1	4.3	1.9	ng/L	2.14	376-06-7	J
11Cl-PF3OUdS*	Not detected	2.1	1.9	ng/L	2.14	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1	1.5	ng/L	2.14	756426-58-1	
ADONA*	Not detected	2.1	2.1	ng/L	2.14	919005-14-4	
HFPO-DA*	Not detected	11	2.1	ng/L	2.14	13252-13-6	

J-Estimated value less than reporting limit, but greater than MDL

Merit Laboratories Login Checklist

Lab Set ID: S43964
Client: OBG02 (Ramboll Americas - East Lansing, MI)
Project: RACER Coldwater Road
Submitted: 01/04/2023 14:40 Login User: MMC

Attention: Clifford Yantz
Address: Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1 154988

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2090 Commonwealth Blvd
CITY: Ann Arbor STATE: MI ZIP CODE: 48105
PHONE NO.: 313-333-0211 CELL NO.: P.O. NO.: 1940002688 (Task 31)
E-MAIL ADDRESS: clifford.yantz@ramboll.com kevin.schneider@ramboll.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG· IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED): PFAS (7475)
439614.01	1/4/23	1256	SS-10	L	3	3							X
.02													

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions: Please Report Sample ID Field Blank - 010423 from COC # 154992 with This Report

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	X Sampler	1/4/23	1330
RECEIVED BY: SIGNATURE/ORGANIZATION		1/4/23	1332
RELINQUISHED BY: SIGNATURE/ORGANIZATION		1/4/23	1440
RECEIVED BY: SIGNATURE/ORGANIZATION		1/4/23	1440

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S30864.01(01)
Generated on 12/23/2021

Report to

Attention: Clifford Yantz
Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S30864.01
Project: RACER Coldwater Road
Collected Date(s): 12/01/2021
Submitted Date/Time: 12/02/2021 16:00
Sampled by: Kevin Schneider
P.O. #: 1940002628

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTM D7968-17M	ASTM Method D7968 - 17 Modified (Isotopic Dilution)
SM2540B	Standard Method 2540 B 2011

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

Analytical Laboratory Report

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S30864.01	Point Repair Soil	Soil	12/01/21 15:30

Analytical Laboratory Report

Lab Sample ID: S30864.01
Sample Tag: Point Repair Soil
Collected Date/Time: 12/01/2021 15:30
Matrix: Soil
COC Reference: 114660

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	3.0	IR
1	4oz Glass	None	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	8.30/7.05/10	ASTM D7968-17M	12/21/21 16:45	KCV	

Inorganics

Method: SM2540B, Run Date: 12/11/21 09:30, Analyst: ELR/B

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	86	1		%	1		

Organics

28 PFAs, Method: ASTM D7968-17M, Run Date: 12/22/21 17:05, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	190		ng/kg	9.3	375-22-4	
PFPeA*	Not detected	93		ng/kg	9.3	2706-90-3	
4:2 FTSA*	Not detected	93		ng/kg	9.3	757124-72-4	
PFHxA*	Not detected	93		ng/kg	9.3	307-24-4	
PFBS*	Not detected	93		ng/kg	9.3	375-73-5	
PFHpA*	Not detected	93		ng/kg	9.3	375-85-9	
PFPeS*	Not detected	93		ng/kg	9.3	2706-91-4	
6:2 FTSA*	Not detected	93		ng/kg	9.3	27619-97-2	
PFOA*	Not detected	93		ng/kg	9.3	335-67-1	
PFHxS*	Not detected	93		ng/kg	9.3	355-46-4	
PFHxS-LN*	Not detected	93		ng/kg	9.3	355-46-4-LN	
PFHxS-BR*	Not detected	93		ng/kg	9.3	355-46-4-BR	
PFNA*	Not detected	93		ng/kg	9.3	375-95-1	
8:2 FTSA*	Not detected	93		ng/kg	9.3	39108-34-4	
PFHpS*	Not detected	93		ng/kg	9.3	375-92-8	
PFDA*	Not detected	93		ng/kg	9.3	335-76-2	
N-MeFOSAA*	Not detected	93		ng/kg	9.3	2355-31-9	
EtFOSAA*	Not detected	93		ng/kg	9.3	2991-50-6	
PFOS*	Not detected	93		ng/kg	9.3	1763-23-1	
PFOS-LN*	Not detected	93		ng/kg	9.3	1763-23-1-LN	
PFOS-BR*	Not detected	93		ng/kg	9.3	1763-23-1-BR	
PFUnDA*	Not detected	93		ng/kg	9.3	2058-94-8	
PFNS*	Not detected	93		ng/kg	9.3	68259-12-1	
PFDoDA*	Not detected	93		ng/kg	9.3	307-55-1	
PFDS*	Not detected	93		ng/kg	9.3	335-77-3	
PFTrDA*	Not detected	93		ng/kg	9.3	72629-94-8	
FOSA*	Not detected	93		ng/kg	9.3	754-91-6	
PFTeDA*	Not detected	93		ng/kg	9.3	376-06-7	
11Cl-PF3OUdS*	Not detected	93		ng/kg	9.3	763051-92-9	
9Cl-PF3ONS*	Not detected	93		ng/kg	9.3	756426-58-1	
ADONA*	Not detected	93		ng/kg	9.3	919005-14-4	

Lab Sample ID: S30864.01 (continued)

Sample Tag: Point Repair Soil

28 PFAs, Method: ASTM D7968-17M, Run Date: 12/22/21 17:05, Analyst: KCV (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
HFPO-DA*	Not detected	93		ng/kg	9.3	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S30864
Client: OBG02 (Ramboll Americas)
Project: RACER Coldwater Road
Submitted: 12/02/2021 16:00 Login User: PFD

Attention: Clifford Yantz
Address: Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

114660

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2090 Commonwealth Blvd
CITY: Ann Arbor STATE: MI ZIP CODE: 48105
PHONE NO.: 313-333-0211 FAX NO.:
P.O. NO.: 1940002628
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com
QUOTE NO.: Task 36

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: Racer Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	MI ID Metals	VOCs	PFAS
30863	12/1/21	1530	Point Repair Soil	S	6	5					1		X	X	X
30864 (PFAS)															

RELINQUISHED BY: SIGNATURE/ORGANIZATION	X Sampler	DATE 12/2/21	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit	DATE 12.2.21	TIME 1510
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit	DATE 12/2/21	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/4/21	TIME 1608

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S30863.01(01)
Generated on 12/15/2021

Report to

Attention: Clifford Yantz
Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Addtional Contacts: Kevin Schneider

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S30863.01
Project: RACER Coldwater Road
Collected Date(s): 12/01/2021
Submitted Date/Time: 12/02/2021 16:00
Sampled by: Kevin Schneider
P.O. #: 1940002628

Table of Contents

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Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
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40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
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Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
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Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
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DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
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O	Analysis performed by outside laboratory. See attached report.
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S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
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p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM2540B	Standard Method 2540 B 2011
SW3050B	SW 846 Method 3050B Revision 2 December 1996
SW5035A	SW 846 Method 5035A Revision 1 July 2002
SW5035A/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5035A Revision 1 July 2002
SW6020A	SW 846 Method 6020A Revision 1 February 2007
SW7471B	SW 846 Method 7471B Revision 2 February 2007

Analytical Laboratory Report

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S30863.01	Point Repair Soil	Soil	12/01/21 15:30

Analytical Laboratory Report

Lab Sample ID: S30863.01
Sample Tag: Point Repair Soil
Collected Date/Time: 12/01/2021 15:30
Matrix: Soil
COC Reference: 114660

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	3.0	IR
1	40ml Glass	MeOH	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/15/21 11:15	JRH	
Sample wt. (g) / Methanol (ml)*	4.471/10	SW5035A	12/06/21 11:40	NDK	
Mercury Digestion	Completed	SW7471B	12/13/21 13:15	JRH	

Inorganics

Method: SM2540B, Run Date: 12/07/21 16:10, Analyst: ELR

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	88	1		%	1		

Metals

Method: SW6020A, Run Date: 12/15/21 14:02, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	1.09	0.20		mg/kg	250	7440-38-2	
Barium	38.5	1.0		mg/kg	250	7440-39-3	
Cadmium	Not detected	0.20		mg/kg	250	7440-43-9	
Chromium	3.70	0.50		mg/kg	250	7440-47-3	
Copper	4.20	0.50		mg/kg	250	7440-50-8	
Lead	6.53	0.30		mg/kg	250	7439-92-1	
Selenium	Not detected	0.40		mg/kg	250	7782-49-2	
Silver	Not detected	0.20		mg/kg	250	7440-22-4	
Zinc	22.1	0.50		mg/kg	250	7440-66-6	

Method: SW7471B, Run Date: 12/13/21 16:19, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	0.067	0.050		mg/kg	65	7439-97-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/08/21 16:52, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	500		ug/kg	134	60-29-7	
Acetone	Not detected	3,000		ug/kg	134	67-64-1	
Methyl iodide	Not detected	300		ug/kg	134	74-88-4	
Carbon disulfide	Not detected	700		ug/kg	134	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	500		ug/kg	134	1634-04-4	
Acrylonitrile	Not detected	300		ug/kg	134	107-13-1	
2-Butanone (MEK)	Not detected	2,000		ug/kg	134	78-93-3	
Dichlorodifluoromethane	Not detected	700		ug/kg	134	75-71-8	
Chloromethane	Not detected	700		ug/kg	134	74-87-3	
Vinyl chloride	Not detected	100		ug/kg	134	75-01-4	
Bromomethane	Not detected	500		ug/kg	134	74-83-9	
Chloroethane	Not detected	700		ug/kg	134	75-00-3	

Lab Sample ID: S30863.01 (continued)
Sample Tag: Point Repair Soil

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/08/21 16:52, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Trichlorofluoromethane	Not detected	300		ug/kg	134	75-69-4	
1,1-Dichloroethene	Not detected	100		ug/kg	134	75-35-4	
Methylene chloride	Not detected	300		ug/kg	134	75-09-2	
trans-1,2-Dichloroethene	Not detected	100		ug/kg	134	156-60-5	
1,1-Dichloroethane	Not detected	100		ug/kg	134	75-34-3	
cis-1,2-Dichloroethene	Not detected	100		ug/kg	134	156-59-2	
Tetrahydrofuran*	Not detected	3,000		ug/kg	134	109-99-9	
Chloroform	Not detected	100		ug/kg	134	67-66-3	
Bromochloromethane	Not detected	300		ug/kg	134	74-97-5	
1,1,1-Trichloroethane	Not detected	100		ug/kg	134	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	7,000		ug/kg	134	108-10-1	
2-Hexanone	Not detected	7,000		ug/kg	134	591-78-6	
Carbon tetrachloride	Not detected	100		ug/kg	134	56-23-5	
Benzene	Not detected	100		ug/kg	134	71-43-2	
1,2-Dichloroethane	Not detected	100		ug/kg	134	107-06-2	
Trichloroethene	Not detected	100		ug/kg	134	79-01-6	
1,2-Dichloropropane	Not detected	100		ug/kg	134	78-87-5	
Bromodichloromethane	Not detected	300		ug/kg	134	75-27-4	
Dibromomethane	Not detected	700		ug/kg	134	74-95-3	
cis-1,3-Dichloropropene	Not detected	100		ug/kg	134	10061-01-5	
Toluene	Not detected	100		ug/kg	134	108-88-3	
trans-1,3-Dichloropropene	Not detected	100		ug/kg	134	10061-02-6	
1,1,2-Trichloroethane	Not detected	100		ug/kg	134	79-00-5	
Tetrachloroethene	Not detected	100		ug/kg	134	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	100		ug/kg	134	110-57-6	
Dibromochloromethane	Not detected	300		ug/kg	134	124-48-1	
1,2-Dibromoethane	Not detected	50		ug/kg	134	106-93-4	M
Chlorobenzene	Not detected	100		ug/kg	134	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	300		ug/kg	134	630-20-6	
Ethylbenzene	Not detected	100		ug/kg	134	100-41-4	
p,m-Xylene	Not detected	300		ug/kg	134		
o-Xylene	Not detected	100		ug/kg	134	95-47-6	
Styrene	Not detected	100		ug/kg	134	100-42-5	
Isopropylbenzene	Not detected	700		ug/kg	134	98-82-8	
Bromoform	Not detected	300		ug/kg	134	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	100		ug/kg	134	79-34-5	
1,2,3-Trichloropropane	Not detected	300		ug/kg	134	96-18-4	
n-Propylbenzene	Not detected	100		ug/kg	134	103-65-1	
Bromobenzene	Not detected	300		ug/kg	134	108-86-1	
1,3,5-Trimethylbenzene	Not detected	100		ug/kg	134	108-67-8	
tert-Butylbenzene	Not detected	100		ug/kg	134	98-06-6	
1,2,4-Trimethylbenzene	Not detected	100		ug/kg	134	95-63-6	
sec-Butylbenzene	Not detected	100		ug/kg	134	135-98-8	
p-Isopropyltoluene	Not detected	300		ug/kg	134	99-87-6	
1,3-Dichlorobenzene	Not detected	300		ug/kg	134	541-73-1	
1,4-Dichlorobenzene	Not detected	300		ug/kg	134	106-46-7	
1,2-Dichlorobenzene	Not detected	300		ug/kg	134	95-50-1	
1,2,3-Trimethylbenzene	Not detected	100		ug/kg	134	526-73-8	
n-Butylbenzene	Not detected	100		ug/kg	134	104-51-8	

M-Result reported to MDL not RDL

Lab Sample ID: S30863.01 (continued)

Sample Tag: Point Repair Soil

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/08/21 16:52, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hexachloroethane	Not detected	800		ug/kg	134	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	700		ug/kg	134	96-12-8	
1,2,4-Trichlorobenzene	Not detected	880		ug/kg	134	120-82-1	
1,2,3-Trichlorobenzene	Not detected	880		ug/kg	134	87-61-6	
Naphthalene	Not detected	700		ug/kg	134	91-20-3	
2-Methylnaphthalene	Not detected	300		ug/kg	134	91-57-6	

Merit Laboratories Login Checklist

Lab Set ID: S30863
Client: OBG02 (Ramboll Americas)
Project: RACER Coldwater Road
Submitted: 12/02/2021 16:00 Login User: PFD

Attention: Clifford Yantz
Address: Ramboll Americas
2090 Commonwealth Blvd
Ann Arbor, MI 48105

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

	Selection			Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

114660

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz / Kevin Schneider
COMPANY: Ramboll
ADDRESS: 2090 Commonwealth Blvd
CITY: Ann Arbor STATE: MI ZIP CODE: 48105
PHONE NO.: 313-333-0211 FAX NO.:
P.O. NO.: 1940002628
E-MAIL ADDRESS: Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com
QUOTE NO.: Task 36

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: Racer Coldwater Road
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kevin Schneider

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	MI ID Metals	VOCs	PFAS
30863	12/1/21	1530	Point Repair Soil	S	6	5					1		X	X	X
30864 (PFAS)															

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	X Sampler	12/2/21	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Merit	12.2.21	1500
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Merit	12/2/21	1600
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		12/4/21	1608

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12