

Revitalizing Auto Communities Environmental
Response Trust

PLANTS 2, 3 & 6 SEWER MODIFICATIONS COMPLETION REPORT

Lansing Industrial Land
Lansing, Michigan

March, 2021





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PLANTS 2, 3 & 6 STORM SEWER MODIFICATIONS COMPLETION REPORT

Lansing Industrial Land
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Prepared for:

Revitalizing Auto Communities
Environmental Response Trust

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ACRONYMS AND ABBREVIATIONS

CB	Catch Basin
CCTV	Closed Circuit Television
HNV	Human Non-Cancer Screening Value
IM	Interim Measure
EGLE	Michigan Department of Environmental, Great Lakes, and Energy
MH	Manhole
ng/L	Nanograms per Liter
PFAS	Poly- and Perfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	perfluorooctanesulfonic acid
PVC	Polyvinyl Chloride
Surface Water Criteria	EGLE Rule 57 Human Non-Cancer Screening Value (HNV) for Surface Water from a Non-Drinking Water Source
RACER	Revitalizing Auto Communities Environmental Response
Site	RACER Lansing Industrial Land

1 INTRODUCTION

Arcadis of Michigan, LLC prepared this Completion Report (Report) on behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust to summarize modifications made to the storm sewer systems on Plants 2, 3, and 6 of the RACER Lansing Industrial Land (the Site) located in Lansing, Michigan (**Figure 1**). These modifications were completed as approved by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and the City of Lansing as an interim measure (IM) to address per- and polyfluoroalkyl substances (PFAS) off-Site discharge in the storm water and sanitary outfalls and will be part of the final corrective measure to address PFAS at the Site.

This Report details modifications to the Plant 2, 3, and 6 storm water and sanitary sewer systems to mitigate the Site's PFAS-impacted storm water discharges to off-Site storm and sanitary sewers owned by the City of Lansing and Ingham County. The scope of work on Plant 2 included abandonment with concrete fill of four stormwater manholes and one sanitary manhole draining the PFAS-impacted area of the Site and capping of associated catch basins to reduce inflow into the system (**Figures 2 and 3**). Modifications to the Plant 3 storm sewer system included abandonment (via concrete fill) of one manhole, capping select catch basins to reduce inflow into the system, and bulkheading a sanitary sewer vault to mitigate off-Site discharge (**Figures 4 and 5**). The scope of work on Plant 6 included plugging several laterals discharging to the Osborn Street storm sewer (**Figure 6**). A closed-circuit television (CCTV) investigation was also performed along three streets surrounding Plant 6 to identify potential sources of infiltration to the storm sewer system as well as any additional connections contributing water to the main line (**Figure 6**). All work was conducted in accordance with the *Interim Measures Work Plan for Plants 2, 3, and 6 Sewer Modifications* dated October 2020 (Arcadis, 2020b). Construction began on November 2, 2020 and CCTV was substantially completed in December 2020.

1.1 Corrective Action Objectives

The objective of the storm sewer modifications is to mitigate off-Site sewer discharge at levels exceeding the PFOS surface water criteria of 12 ng/L. The points of compliance for Plant 2 are the northwest outfall, (P2-MH-2), northeast outfall (P2-MH-9), and the southwest outfall (P2-MH-W) (**Figure 2**); and the northeast sanitary outfall (2-004) (**Figure 3**). The points of compliance for Plant 3 are the northwest (P3-MH-284), northeast (P3-MH-NE) (**Figure 4**) and the eastern sanitary vault outfall (**Figure 5**). The Plant 6 points of compliance are the manholes in Michigan Ave, Verlinden Ave, and Osborn Rd (**Figure 6**).

2 STORM SEWER MODIFICATIONS

The primary tasks completed under this scope of work are described in the *Interim Measures Work Plan: Plants 2, 3, and 6 Sewer Modifications* (Arcadis, 2020b) and included the following:

1. Capping of selected catch basins on Plants 2 and 3 to minimize surface water infiltration into the abandoned storm system and reduce the likelihood that impacted storm water will daylight at the surface.
2. Filling selected structures on Plants 2 and 3 with concrete to isolate PFAS-impacted regions of the Site and prevent impacted sewer water from reaching outfalls.
3. Plugging all inlet pipes coming from Plant 6 to the Osborn catch basin and manhole to block storm water from entering the manhole and discharging off-Site.

Field notes for the associated activities can be referenced in **Appendix A**.

2.1 Plant 2 Sewer Modifications

2.1.1 Storm Sewer Modifications

In December 2020, 18 catch basins were capped to reduce inflow to the portion of the sewer system to be deactivated (**Figure 2**). Capping catch basins is a best practice to reduce surface water inflow, hydraulic pressure on deactivated storm pipes, and the possibility of water from storm sewer lines daylighting to ground surface through open catch basins following large storm events. Consistent with prior modifications, a polyvinyl chloride (PVC) liner was caulked onto the existing grate or cover. Replacement grates were installed on catch basins that were missing a cover. A steel sheet was then caulked on top of the PVC liner and approximately one foot of 21AA aggregate was placed on top of the steel sheet (**Figure 7**).

Four storm sewer manholes (P2-MH-10, P2-MH-16, P2-MH-59, and P2-MH-79) were filled in place with concrete in December 2020 to isolate impacted regions of the storm sewer system (**Figure 2**). The concrete used to fill the manholes was designed to cure underwater to minimize the need to keep the manholes structures dry prior to filling. The manholes were first dewatered, and to the extent practical, any excess sludge and sediment was removed prior to filling the structures with concrete. Cleaning the structures improved the likelihood of a proper seal between the concrete and the existing structure to block flow through the sewers. The manholes were filled with concrete to ground surface. Concrete installation followed standard construction practices including consolidation (i.e., vibrating) to eliminate air voids and ensure complete placement. The concrete cured for 2 to 3 days while Arcadis monitored for signs of cracking or settling. Sewer water and wash water from cleaning were pumped into dewatering boxes staged on-Site, characterized, and disposed of at an appropriate off-Site disposal facility.

Typical details of a catch basin cap and a filled manhole are provided on **Figure 7** and a photo log of these activities is presented in **Appendix B**.

2.1.2 Sanitary Sewer Modifications

Sanitary sewer manhole P2-SAN-3-7 was cleaned and filled with concrete according to the procedure described in Section 2.1.1 (**Figure 3**). P2-SAN-3-7 was filled instead of sanitary outfall 2-004, which is on a steep embankment that slopes down to W. Saginaw Street, and is not safely accessible.

2.2 Plant 3 Sewer Modifications

2.2.1 Storm Sewer Modifications

Manhole P3-MH-308 was cleaned filled with concrete according to the procedure described in Section 2.1.1 (**Figure 4**). All catch basins in the P3-MH-308 drainage area were capped to minimize surface water inflow and hydraulic pressure on deactivated storm pipes of the sewer system to be deactivated.

2.2.2 Sanitary Sewer Modifications

Plant 3 sanitary sewer modifications consisted of installing one reinforced concrete bulkhead in the Plant 3 sanitary vault located along the eastern site boundary. The 30-inch influent pipe was bulkheaded at the entrance to the structure to prevent potentially PFAS-impacted groundwater from discharging from Site and maintain the vault for future use if desired (**Figure 5**). Prior to bulkheading, the contractor stopped the water flow by installing an inflatable plugs at an upstream manhole. The bulkhead was then installed in the vault by pouring a reinforced concrete form (bulkhead) inside the upstream invert. Concrete placement followed standard construction practices including but not limited to consolidation (i.e., vibrating) to eliminate air voids and ensure complete placement. Following curing, holes were drilled every 12 inches around the entire circumference of the bulkhead and a polyurethane grout was be injected into the holes. The holes allow the injected grout to spread out and seal the entire contact surface between the new concrete and the sewer pipe as indicated in **Figure 8**.

2.3 Plant 6 Storm Sewer Modifications and Inspection

2.3.1 Storm Sewer Modifications

Five onsite stormwater laterals discharged into Outfall manhole Osborn-MH-1 (**Figure 6**). Of the five pipes, one was abandoned during prior modifications; one pipe is a corrugated drainage pipe with no upstream access; a third pipe connects to a partially abandoned storm sewer pipe with access via a nearby catch basin; and a fourth and fifth pipe have no known upstream access. These pipes associated with drainage from Site into Osborn-MH-1 were plugged at the Osborn-MH-1 manhole using hydraulic cement, except for the pipe with access via an upstream catch basin (Osborn-CB-1). The pipe entering Osborn-CB-1 from the Site was plugged rather than filling the manhole to allow drainage of runoff from Osborn Road as the catch basin is outside of Site.

2.3.2 CCTV Inspection Results

CCTV inspection of the storm sewer in Verlinden Avenue, Osborn Road, and Michigan Avenue was completed to inspect for evidence of groundwater infiltration through pipe joints or cracks, discharge from

PLANTS 2, 3 & 6 STORM SEWER MODIFICATIONS COMPLETION REPORT

sewer lateral connections, and to observe pipe integrity issues that would affect future sewer modifications. Key observations from the CCTV inspection are shown on **Figure 6** and are summarized below:

- An active catch basin along Osborn Street had a trickle of water inflow from a pipe, which appeared to be coming from the direction of the Site. This catch basin will be investigated further.
- Evidence of minor groundwater infiltration in the sewer pipe was observed in Michigan Avenue and Osborn Street.
- There were multiple active (dripping) pipe intrusions noted along Michigan Avenue and Verlinden Avenue, some of which were not previously mapped.
- A collapsed sewer tile was observed south of Verlinden Avenue MH-3, but there was no associated groundwater infiltration. The tile did block the path of the CCTV camera.
- A thin layer of sheen was noted in manhole MichAve-MH-9. Manhole MichAve-MH-9 is not located near to any known historical LNAPL impacts onsite. The pipe extending toward the Site from MichAve-MH-9 was inspected by CCTV up to the cap that was installed during demolition. No evidence of sheen or oil was observed in that pipe; therefore it does not appear to have originated from the Site. Sheen was not noted upstream or downstream of MichAve-MH-9 in Michigan Avenue manholes. The sheen is likely associated with vehicular traffic on Michigan Ave.
- Portions of the Michigan Avenue, Verlinden Avenue, and Osborn Road could not be accessed due to sediment levels or pipe obstructions, as noted on **Figure 6**.

In summary, there is evidence of some groundwater infiltration and active pipe taps into the offsite sewers, although the contribution from the Site generally appears to be small. The CCTV inspection report is included as **Appendix C**.

3 PERFORMANCE MONITORING

This section describes the performance monitoring completed to evaluate the effectiveness of the storm sewer modifications with respect to objectives and minimizing any adverse effects from completing the modifications.

3.1 Stormwater Monitoring Plan and Results

The following preliminary inspections, observations, and sampling were completed on Plants 2, 3, and 6 in 2020 following May 2020 and November 2020 construction activities:

3.1.1 Visual Inspections

- July 2020 sampling event – The eastern Plant 3 sanitary outfall and northeast storm outfall had no discharge. Trickle flow was observed in the Plant 3 northwest outfall manhole discharge pipe. Trickle flow was observed in the Plant 2 southwest outfall manhole discharge pipe. Low flow was observed in the Plant 2 northwest outfall manhole discharge pipe. The Plant 2 northeast outfall manhole had no flow. No flow was observed discharging into the Plant 2 northeast sanitary outfall. At Plant 6, Low flow was observed in the Osborn-MH-1 discharge pipe. No flow was observed in the Verlinden-MH-1 and Verlinden-MH-4 discharge pipes. Low flow was observed in the MichAve-MH-4 discharge pipe.
- August 2020 precipitation event – Inspections of all three plants were completed within 24-hours of a significant rain event. Ponding was noted at Plants 2 and 3. Ponding was particularly heavy in the southern and southeastern portions of Plant 2 and southern and eastern portions of Plant 3. Runoff was not observed leaving Site via overland flow. Discharge was noted in the Plant 3 Sanitary Vault that had not been noted during dry weather sampling events.
- December 2020 sampling event – The eastern Plant 3 sanitary outfall manhole discharge pipe had no flow. The Plant 3 northeast outfall manhole discharge pipe had no flow. The Plant 3 northwest outfall manhole discharge pipe had no flow. Low flow was observed in the Plant 2 northwest outfall manhole discharge pipe. The Plant 2 northeast outfall manhole had no flow. Low flow was observed in the Plant 2 southwest outfall manhole. No flow was observed in the Osborn-MH-1 and Verlinden-MH-1 discharge pipes. Low flow was observed in the Verlinden-MH-4 and MichAve-MH-4 discharge pipes.
- An inspection was performed following a major snowmelt event on March 1, 2021, and is described in Section 3.2

3.1.2 Confirmation Sampling Results

Confirmatory dry weather sampling for PFAS was completed on Plants 2, 3, and 6 following construction in December 2020. Sampling of select manholes was also completed in February 2021 on Plant 2. The next outfall sampling event is scheduled for March 2021.

3.1.2.1 Plant 2

Eight manholes were sampled in December 2020 on Plant 2 to evaluate the effectiveness of the November 2020 modifications. The northwest outfall manhole (P2-MH-2) and southwest outfall manhole

(P2-MH-W) were below surface water criteria. Manhole P2-MH-30, located immediately upstream of P2-MH-2, returned 84.7 ng/L PFOS, while downstream and upstream manholes had detections of 10.1 ng/L and 9 ng/L, respectively. Due to the apparently anomalous higher level of PFOS in P2-MH-30 from the December event, P2-MH-30 and four other manholes were re-sampled in February 2021, with P2-MH-30 results being 29.0 ng/L (**Figure 9**). Reductions of PFOS were observed throughout the network following modifications, including a 93% reduction in PFOS at outfall P2-MH-2 since January 2019. PFOA remained below surface water criteria at all locations.

Estimated flow rates through the manholes were also noted during the sampling event to assist with mass loading and source identification assessments throughout the storm sewer network. Flows were visually estimated and categorized by no flow, trickle (<1 GPM), low flow (1-3 GPM), and moderate flow (>3 GPM) and can be seen in **Figure 9**.

Full sampling results are included on **Figure 9** and **Table 1**, and laboratory reports are included in **Appendix C**.

3.1.2.2 Plant 3

Three manholes were sampled in December 2020 on Plant 3. The PFOS result for the northwest manhole P3-MH-284 was 3.3 ng/L, below surface water criteria. Reductions of PFOS were observed throughout the network and both PFOS and PFOA remained below surface water criteria at all locations. Detailed sampling results are summarized on **Figure 10** and **Table 2**, and laboratory reports are included in **Appendix D**.

3.1.2.3 Plant 6

Twelve manholes were sampled in December 2020 on Plant 6, including outfalls Osborn-MH-1, Verlinden-MH-1, Verlinden-MH-4, and MichAve-MH-4. The PFOS results for the December 2020 sampling event for these manholes were 24.0 ng/L, 8.1 ng/L, 16.9 ng/L, and 12.6 ng/L, respectively. Exceedances of surface water criteria were detected in Osborn-MH-1, Verlinden-MH-4, Verlinden-MH-5, and MichAve-MH-4. PFOA remained below surface water criteria at all locations. Detailed sampling results are summarized on **Figure 11** and **Table 3**, and laboratory reports are included in **Appendix D**.

3.2 Stormwater Inspections

Increased surface ponding was expected to occur on the Site following implementation of the storm sewer modifications due to the capped catch basins and concrete slab limiting infiltration. Post-construction stormwater inspections will be performed to monitor ponding and ensure that modifications do not create unacceptable runoff onto neighboring properties. Arcadis staff will mobilize to Site to complete observations within 24 hours of at least four significant rain events (>0.5 inches of water).

The first of these four inspections was completed on March 1, 2021. Onsite ponding was consistent with prior inspections and no run-off was noted leaving site that did not exist prior to sewer modifications on either plant. Upstream and downstream manholes were inspected where able to verify integrity of fills completed in November 2020. All fills are intact and successfully preventing discharge from impacted areas of site.

3.3 Performance Monitoring Progress

Storm sewer dry weather water quality sampling was completed in December 2020 on all Plants and select Plant 2 manholes were resampled in February 2021. December 2020 results are presented in **Figures 9, 10, and 11** and **Tables 1, 2, and 3**. No samples have been collected from the Plant 3 northeast outfall manhole, the Plant 3 sanitary vault, and the Plant 2 northeast storm and sanitary outfalls following modifications, because there has not been flow discharging. Quarterly dry weather outfall sampling will continue throughout 2021 if discharge is noted. Additional storm sewer sampling and/or further modifications will be recommended based on ongoing evaluation of sample results.

4 NEXT STEPS

4.1 Plant 2

December 2020 and February 2021 sampling indicated that while the northwest outfall (P2-MH-2) is below surface water criteria, upstream manhole P2-MH-29 is contributing PFOS concentrations that have the potential to increase concentrations at the outfall to above surface water criteria. P2-MH-29 also had elevated “other PFAS” as shown in **Table 1** compared to other site samples. Further investigation of manholes P2-MH-29, P2-MH-28, and associated piping, as well as a fingerprint evaluation of the “other” PFAS compounds will be completed to determine next steps.

4.2 Plant 3

Corrective action objectives have been met at the Plant 3 outfalls; therefore no additional modifications are proposed for Plant 3 at this time. The northwest, northeast, and sanitary outfalls will continue to be monitored as discussed in **Section 3.3**.

4.3 Plant 6

The catch basin observed discharging water upstream of Osborn-MH-2 during CCTV inspection will be investigated to evaluate if further modifications are needed. The catch basin will be sampled to evaluate PFOS impacts to the Osborn Street sewer. Corrective actions, if required, will be presented in a separate workplan submitted to EGLE. Monitoring will continue as discussed in **Section 3.3**.

5 CONCLUSION

In November 2020, RACER completed modifications to the Plant 2, 3, and 6 storm sewer systems to mitigate PFAS-impacted storm water discharges to off-Site storm sewers. Modifications included capping of catch basins on Plants 2 and 3, filling of manhole structures on Plants 2 and 3, installation of a bulkhead in the Plant 3 Sanitary Vault, and plugging of laterals discharging to the Plant 6 Osborn Street outfall. A CCTV inspection along Michigan Avenue, Verlinden Avenue, and Osborn Road identified minor sources of groundwater infiltration into the offsite sewers. Initial Site inspections indicate that the modifications have been effective at significantly mitigating volume, concentration, and discharge of PFAS-impacted water off-Site through the Site storm sewer system and no adverse stormwater runoff to the surrounding properties has been observed. Post-implementation performance monitoring will continue through 2021 to verify that the IM objectives are met and/or identify the need for additional corrective actions, including identified potential modifications on Plants 2 and 6.

6 REFERENCES

- Arcadis, 2011. Quality Assurance Project Plan – Lansing Plants 2, 3, and 6, Industrial Land, Lansing, Michigan. August 2011.
- Arcadis, 2018. Plant 3 Storm Sewer Modifications Interim Measures Work Plan. May 24.
- Arcadis, 2019a. Plant 3 Bulkheading Completion Report. January 25.
- Arcadis, 2019b. PFAS Storm Sewer Sampling Results- Plant 2 RACER Trust Site, Lansing, Michigan. January 29.
- Arcadis, 2019c. Poly- and Perfluorinated Alkyl Substance (PFAS) Field Sampling Guidance. March 26.
- Arcadis, 2019d. Interim Measures Work Plan: Plants 2 and 3 Storm Sewer Modifications. July 16.
- Arcadis, 2019e. Interim Measures Work Plan: Plant 6 Storm Sewer Modifications. October 18.
- Arcadis, 2019f. Revised Interim Groundwater Monitoring Work Plan – 2019, RACER Trust Plants 2, 3, & 6, Lansing, Michigan. October 28.
- Arcadis, 2020a. Plants 2, 3, and 6 Storm Sewer Modifications Completion Report. August 14.
- Arcadis, 2020b. Interim Measures Work Plan: Plants 2, 3, and 6 Sewer Modifications. October.

TABLES



Table 1
Plant 2 Storm Sewer Confirmation Sampling Results
Plants 2, 3, 6 Storm Sewer Modificatins Completion Report and Workplan
RACER Trust - Plant 2 Industrial Land, Lansing, Michigan

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P2-CB-32 12/10/20	P2-MH-2 12/10/20	P2-MH-2 02/01/21	P2-MH-14 12/10/20	P2-MH-25 12/10/20	P2-MH-26 12/10/20	P2-MH-29 02/01/21	P2-MH-30 12/10/20	P2-MH-30 02/01/21
Results											
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	3.2	10.1	10.6	78.8	7.3 [7.7]	6.7	58.7	84.7	29.0[10.7]
Perfluorooctanoic acid (PFOA)	ng/L	12,000	1.1 J	6.9	8.7	30.8	13.2 [14]	10.3	5.8	6.6	8.3[8.5]
Other PFAS	ng/L	NC	46.62	76.9	56.4	166.9	98.4 [61.8]	56.2	325.9	160.3	92.6[58.7]

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P2-MH-32 02/01/21	P2-MH-NW 12/10/20	P2-MH-NW 02/01/21	P2-MH-W 12/10/20
Results						
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	1.5 J	9.0	7.9	2.6
Perfluorooctanoic acid (PFOA)	ng/L	12,000	1.7 J	5.9	11.1	2.5
Other PFAS	ng/L	NC	47.5	67.5	61.2	38.5

Notes:

Shaded

Exceeds Rule 57 Human Non-Cancer Screening
Value for Surface Water from a Non-Drinking Water
Source for PFOS or PFOA

NC = No criteria
ng/L = Nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
[] Indicates duplicate sample
J = Indicates an estimated value below laboratory reporting limit
< = The compound was analyzed for but not detected.
All samples analyzed using USEPA Method 537M, Michigan List of 28

Table 2
Plant 3 Storm Sewer Confirmation Sampling Results
Plants 2, 3, 6 Storm Sewer Modificatins Completion Report and Workplan
RACER Trust - Plant 3 Industrial Land, Lansing, Michigan

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P3-MH-284 12/09/20	P3-MH-290 12/09/20	P3-MH-297 12/09/20
Results					
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	3.3	2.0 [1.5 J]	2.4
Perfluorooctanoic acid (PFOA)	ng/L	12,000	<1.0	<1.0 [<0.89]	<1.0
Other PFAS	ng/L	NC	38.0	45.9 [34.05]	37.0

Notes:

Shaded

Exceeds Rule 57 Human Non-Cancer Screening
Value for Surface Water from a Non-Drinking Water
Source for PFOS or PFOA

NC = No criteria
ng/L = Nanograms per liter
PFAS = Per- and polyfluoroalkyl substances

[] Indicates duplicate sample
J = Indicates an estimated value below laboratory reporting limit
< = The compound was analyzed for but not detected.
All samples analyzed using USEPA Method 537M, Michigan List of 28

Table 3
Plant 6 Storm Sewer Confirmation Sampling Results
Plants 2, 3, 6 Storm Sewer Modificatins Completion Report and Workplan
RACER Trust - Plant 6 Industrial Land, Lansing, Michigan

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	Osborne-MH-1 12/09/20	Verlinden-MH-1 12/09/20	P6-MH-16 12/09/20	Verlinden-MH-2 12/09/20	P6-MH-17 12/09/20	Verlinden-MH-3 12/09/20	Verlinden-MH-4 12/09/20
Results									
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	24.0	8.1	18.6	9.2	29.1	11.1 [11.3]	16.9
Perfluorooctanoic acid (PFOA)	ng/L	12,000	39.7	40.5	45.9	21.5	120.0	31.4 [32.1]	35.1
Other PFAS	ng/L	NC	148.9	145.3	165.7	307.2	258.6	361.9 [389.7]	438.3

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	Verlinden-MH-5 12/09/20	P6-MH-18 12/09/20	P6-MH-19 12/09/20	MichAve-MH-4 12/09/20	MichAve-MH-3 12/09/20
Results							
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	12.2	13.9	11.6	12.6	3.8
Perfluorooctanoic acid (PFOA)	ng/L	12,000	43.9	61.9	87.1	16.1	3.0
Other PFAS	ng/L	NC	243.3	142.7	407.2	77.3	43.5

Notes:

Shaded

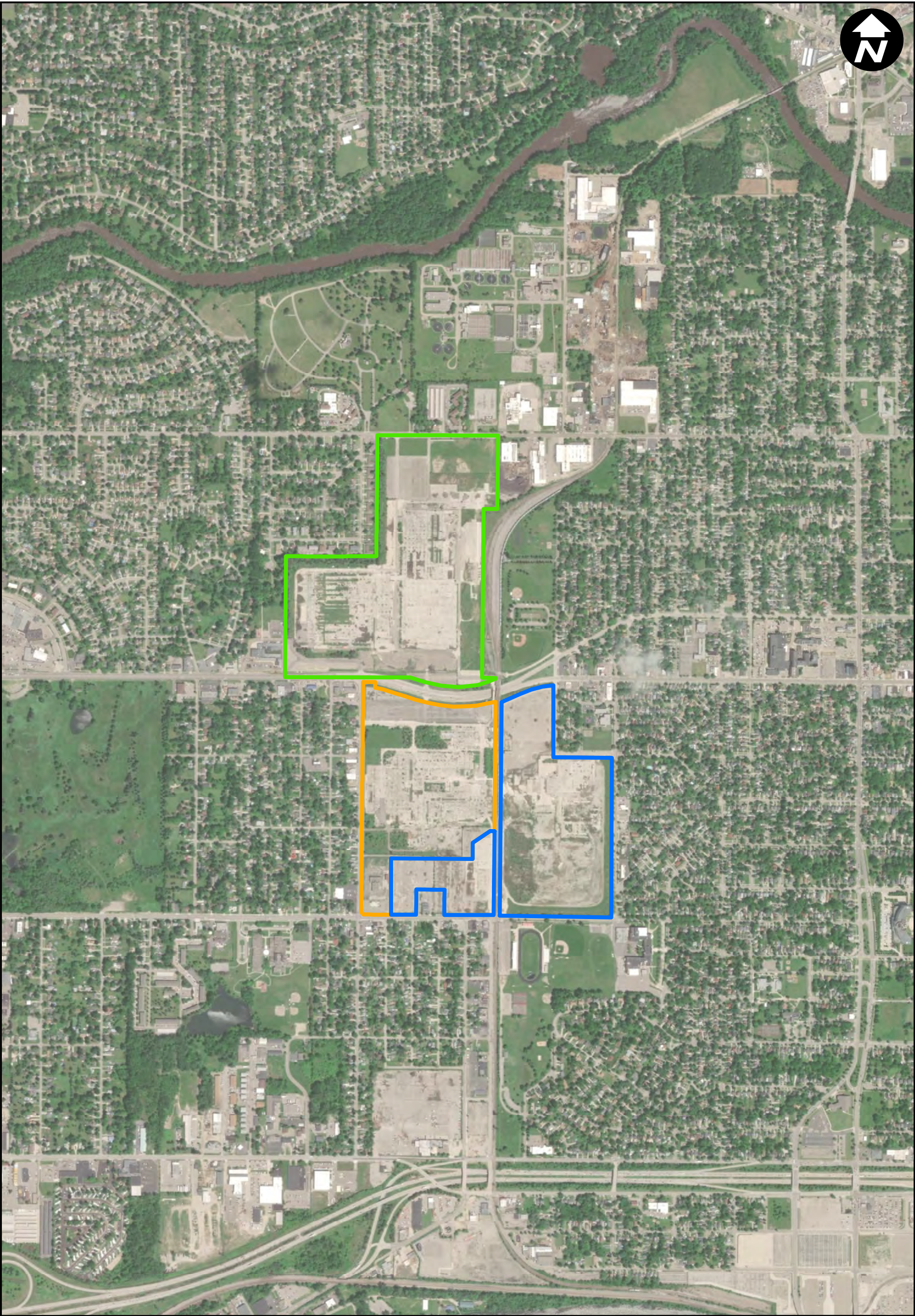
Exceeds Rule 57 Human Non-Cancer Screening
Value for Surface Water from a Non-Drinking Water
Source for PFOS or PFOA

NC = No criteria
ng/L = Nanograms per liter
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All samples analyzed using USEPA Method 537M, Michigan List of 28

FIGURES

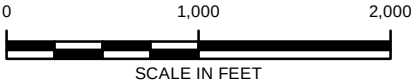


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T:_ENV\RACER\Buffalo\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Old\old_Figure 1 - Site Location.mxd PLOTTED: 2/11/2021 10:30:27 AM BY: KPullen



PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6



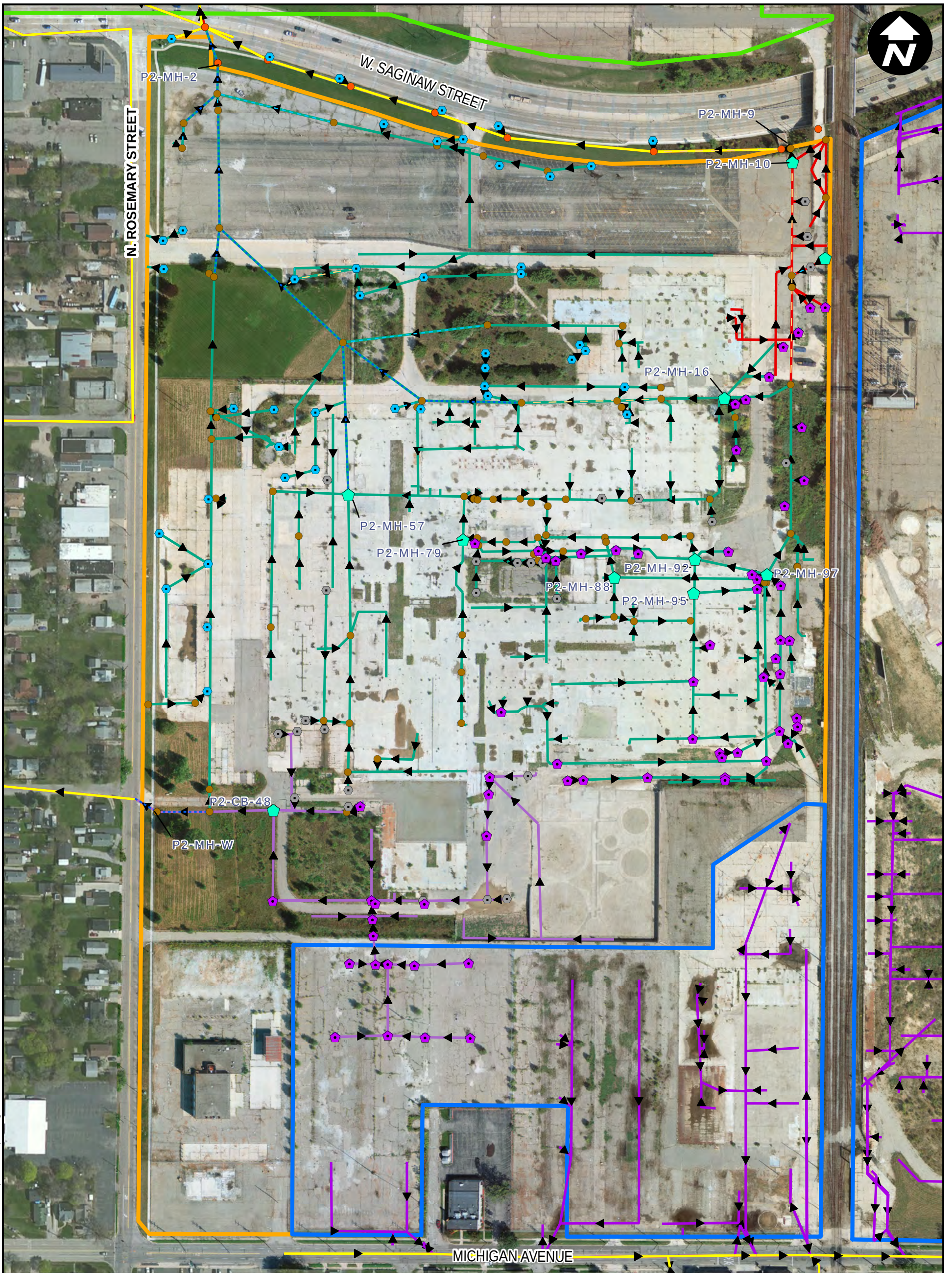
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RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SITE LOCATION



CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30075941.03600 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Bulfao\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 5A - Plant 2 Storm Sewer Modifications 2020.mxd PLOTTED: 3/17/2021 3:54:42 PM BY: KPullen



STRUCTURES & SAMPLE POINTS

- MANHOLE
- OFFSITE MANHOLE
- FILLED STRUCTURE
- CAPPED STRUCTURE
- CATCH BASIN REMAINING OPEN
- COULD NOT LOCATE STRUCTURE

OBSERVED FLOW (DECEMBER 2020)

- NO FLOW
- TRICKLE (~1 GPM OR LESS)
- LITTLE (~1-3 GPM)

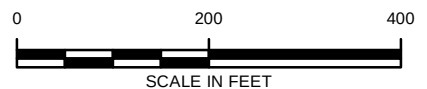
PLANT 2 DRAINAGE NETWORKS

- NORTHEAST (PARTIALLY ABANDONED)
- CENTRAL (PARTIALLY ABANDONED)
- SOUTHWEST (ABANDONED)
- STORM LINE
- OFFSITE STORM LINE

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-FIGURE REFLECTS ALL MODIFICATIONS COMPLETED IN 2019 AND 2020.

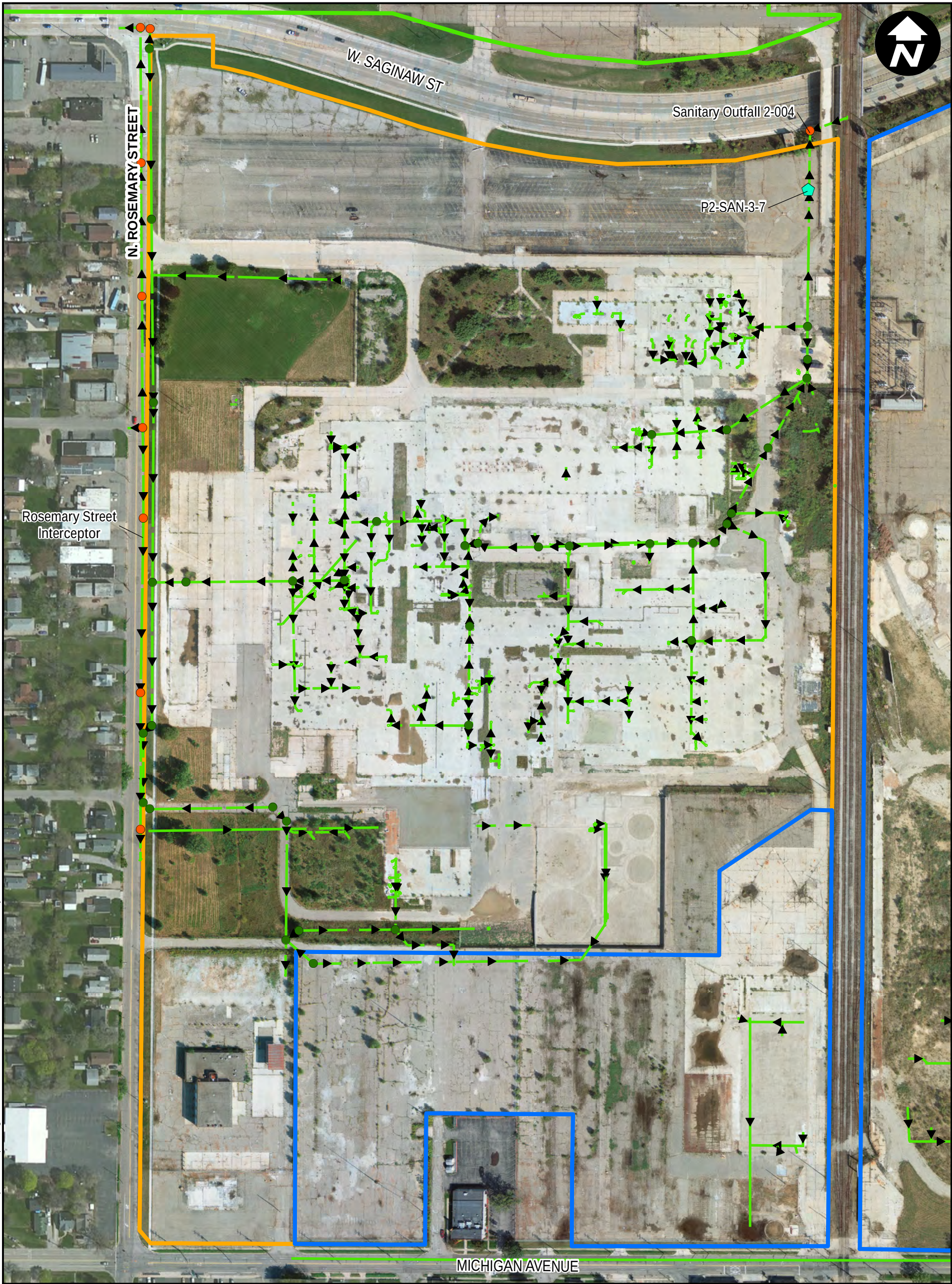


RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 2 STORM SEWER
MODIFICATIONS



CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 1B - Plant 2 Storm Sanitary Modifications Plan Layout.mxd PLOTTED: 2/1/2021 12:06:26 PM BY: KPullen



STRUCTURES

- MANHOLE
- OFFSITE MANHOLE
- ◆ FILLED STRUCTURE
- ➔ SANITARY SEWER

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6



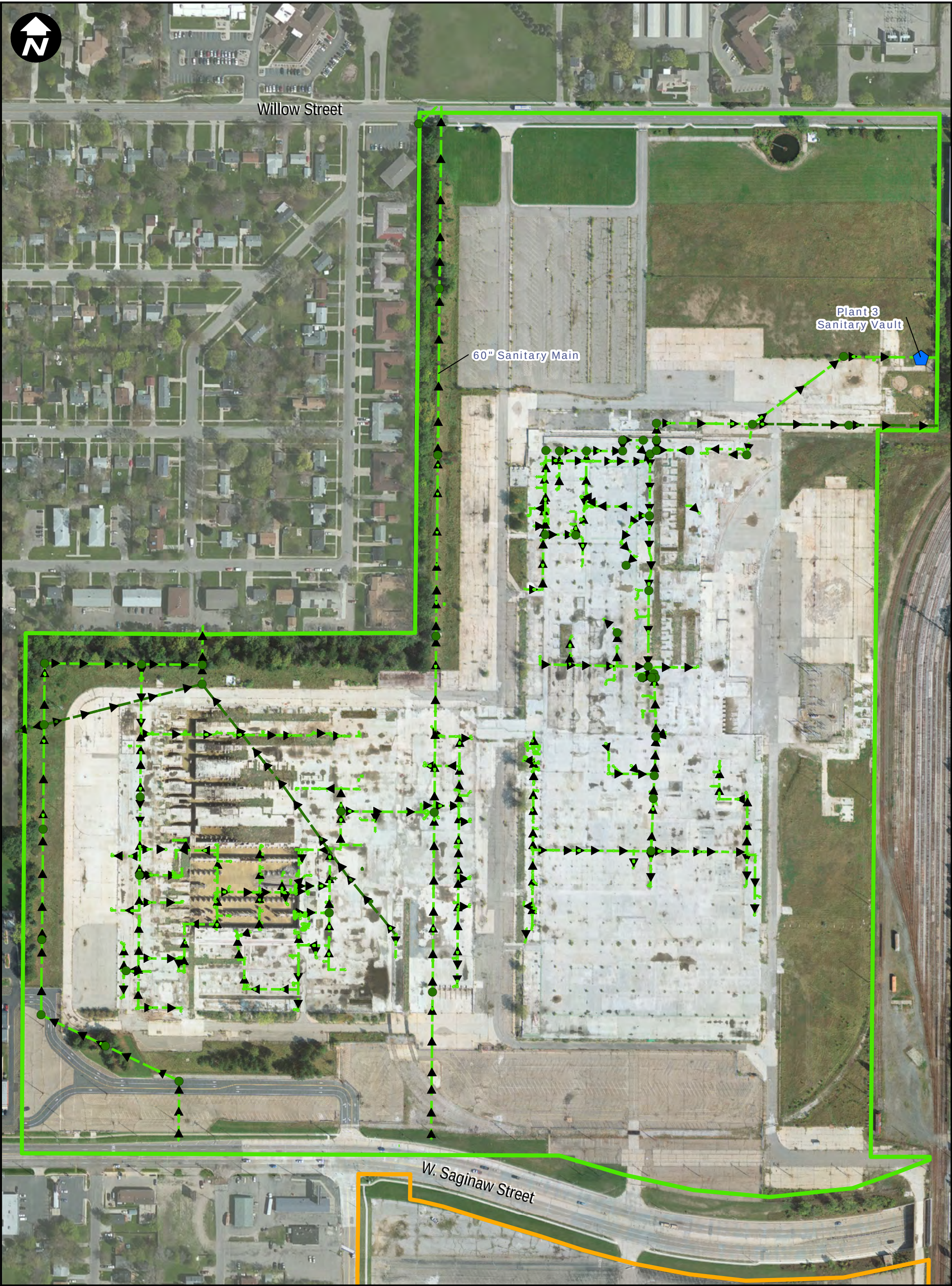
NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-AERIAL IMAGERY FROM ESRI ARCGIS
ONLINE AND AN OCTOBER 2013 SITE
FLYOVER CONDUCTED BY ENG, INC
-SANITARY OUTFALL 2-004 WAS THE
ONLY SANITARY OUTFALL THAT COULD
BE LOCATED AT PLANT 2. NO OUTFALL
WAS IDENTIFIED ALONG THE WESTERN
PROPERTY BOUNDARY.

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 2 SANITARY SEWER
MODIFICATIONS



CITY: NOVI DIV: ENV. PIC: J. BARRETT, PK: R. CHRISTENSEN, TM: A. LORENZ, TR: J. SALING PROJECT NUMBER: 3007534L03600 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Int
T:\ENVI\ACER\Burling\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Compilation Report\Figure 2B - Plant 3 Sanitary Sewer Modifications Plan Layout.mxd PLOTTED: 3/17/2023 4:04:48 PM BY: KPullen



- STRUCTURES
- SANITARY MANHOLE
 - BULKHEAD
- PLANT BOUNDARIES
- PLANT 2
 - PLANT 3

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-AERIAL IMAGERY FROM ESRI ARCGIS
ONLINE AND AN OCTOBER 2013 SITE
FLYOVER CONDUCTED BY ENG, INC
-THE EASTERN SANITARY OUTFALL
WAS THE ONLY OUTFALL THAT COULD
BE IDENTIFIED IN THE FIELD AND IS
LOCATED NEAR THE PFAS SOURCE
AREA.

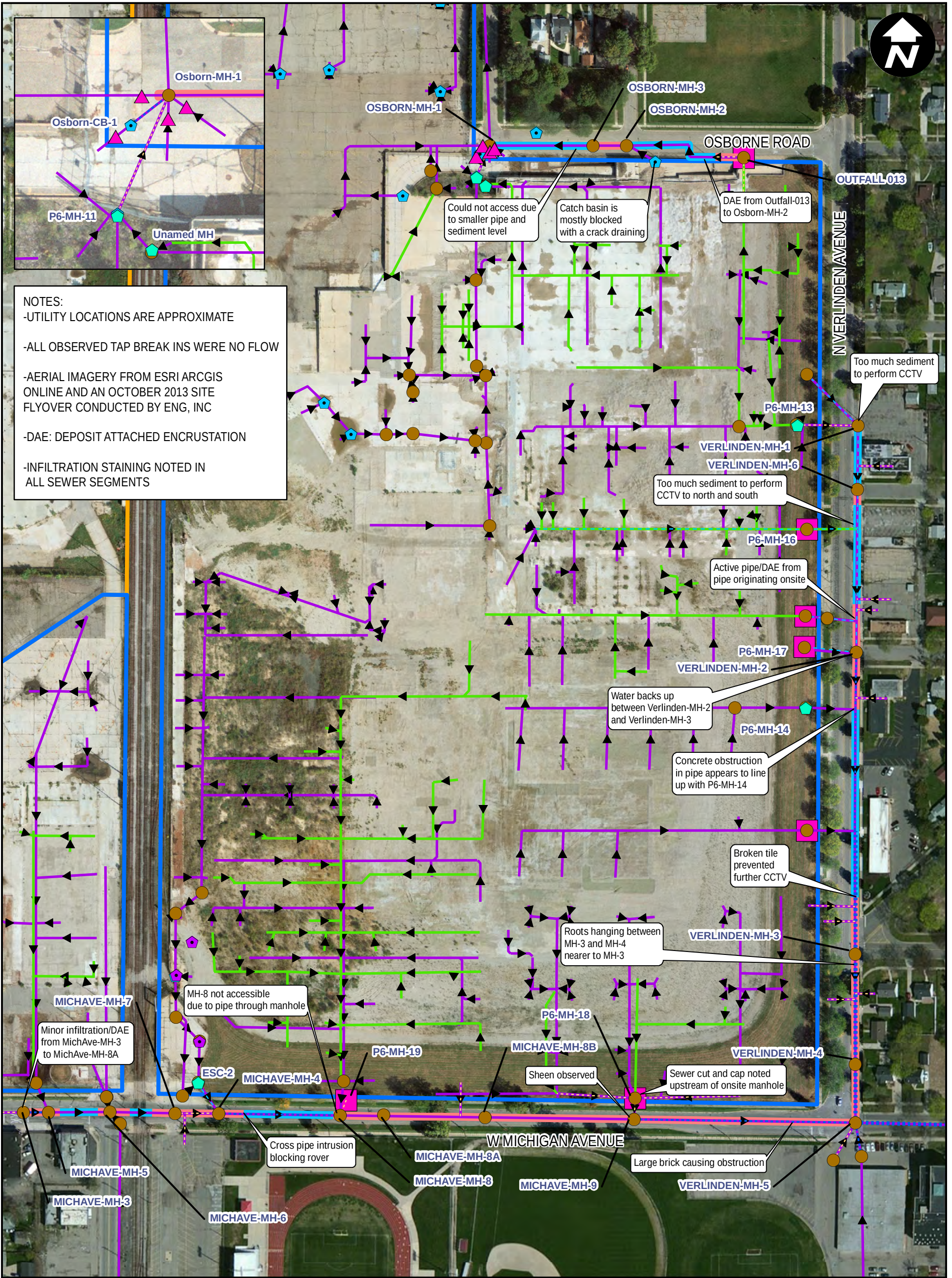


RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 3 SANITARY SEWER
MODIFICATIONS



CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TR: J. SALING PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl T:_ENV\RACER\Buofo\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 6 - Plant 6 Storm Sewer Modifications and CCTV Inspection Results_DEC2020.mxd PLOTTED: 3/24/2021 11:47:46 AM BY: KPullen



NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ALL OBSERVED TAP BREAK INS WERE NO FLOW
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-DAE: DEPOSIT ATTACHED ENCRUSTATION
-INFILTRATION STAINING NOTED IN ALL SEWER SEGMENTS

- PLUGGED PIPE
- FILLED STRUCTURE
- CAPPED STRUCTURE
- SEWER LINE CUT AND CAPPED AT PROPERTY LINE DURING 2014 DEMOLITION
- CCTV COMPLETED
- PIPE INACCESSIBLE TO CCTV
- MANHOLE
- CATCH BASIN REMAINING OPEN

- PLANT 6 DRAINAGE NETWORKS
- STORM LINE
 - SANITARY LINE
- OBSERVED FLOW (DECEMBER 2020)
- NO FLOW
 - TRICKLE (~1 GPM OR LESS)
 - LITTLE (~1-3 GPM)
 - MODERATE (~3 GPM OR GREATER)

- PLANT BOUNDARIES
- PLANT 2
 - PLANT 6

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-THE EASTERN SANITARY OUTFALL WAS THE ONLY OUTFALL THAT COULD BE IDENTIFIED IN THE FIELD AND IS LOCATED NEAR THE PFAS SOURCE AREA.
-FIGURE REFLECTS ALL MODIFICATIONS COMPLETED IN 2019 AND 2020

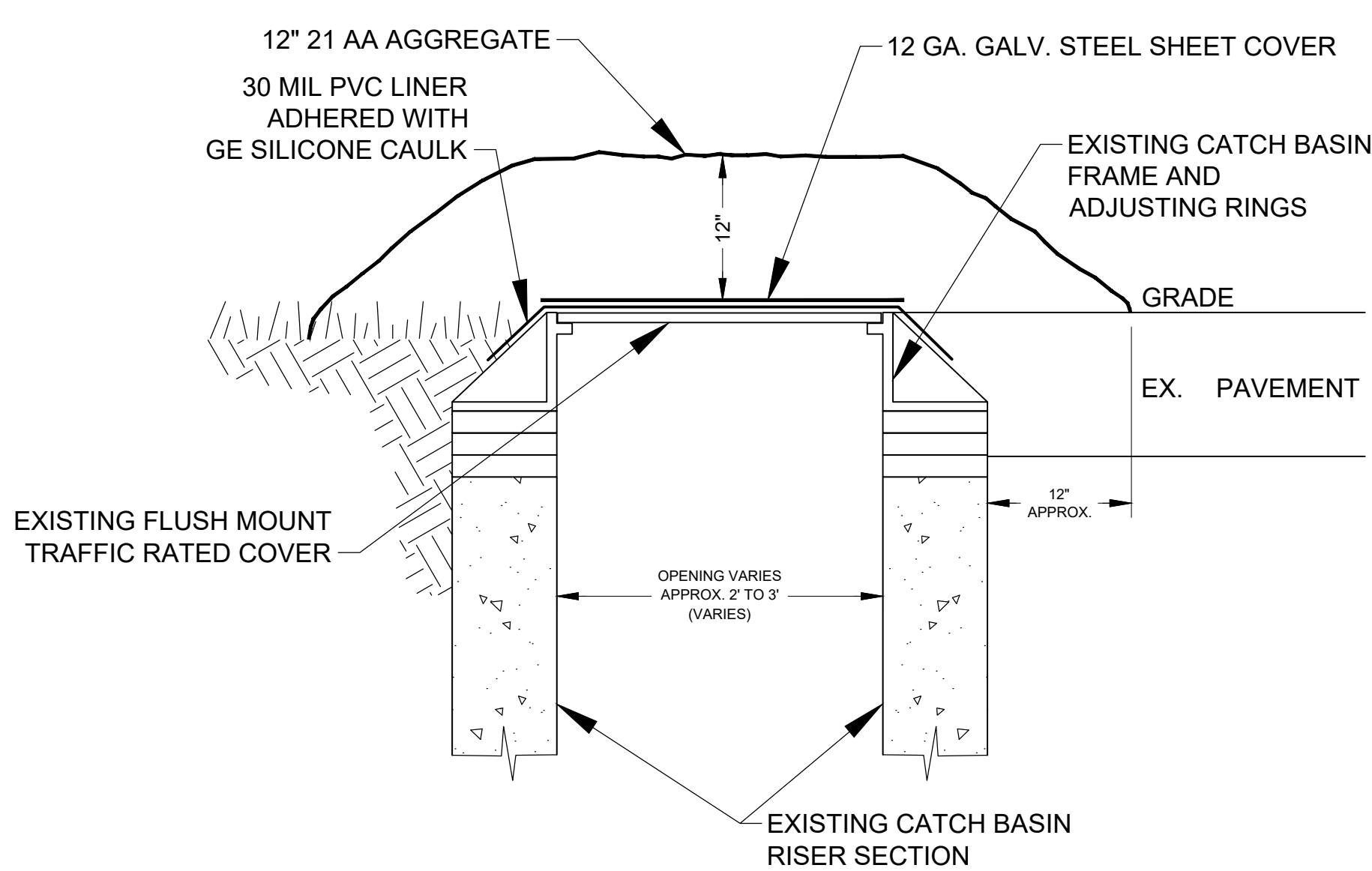


RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 6 STORM SEWER MODIFICATIONS
AND CCTV INSPECTION RESULTS



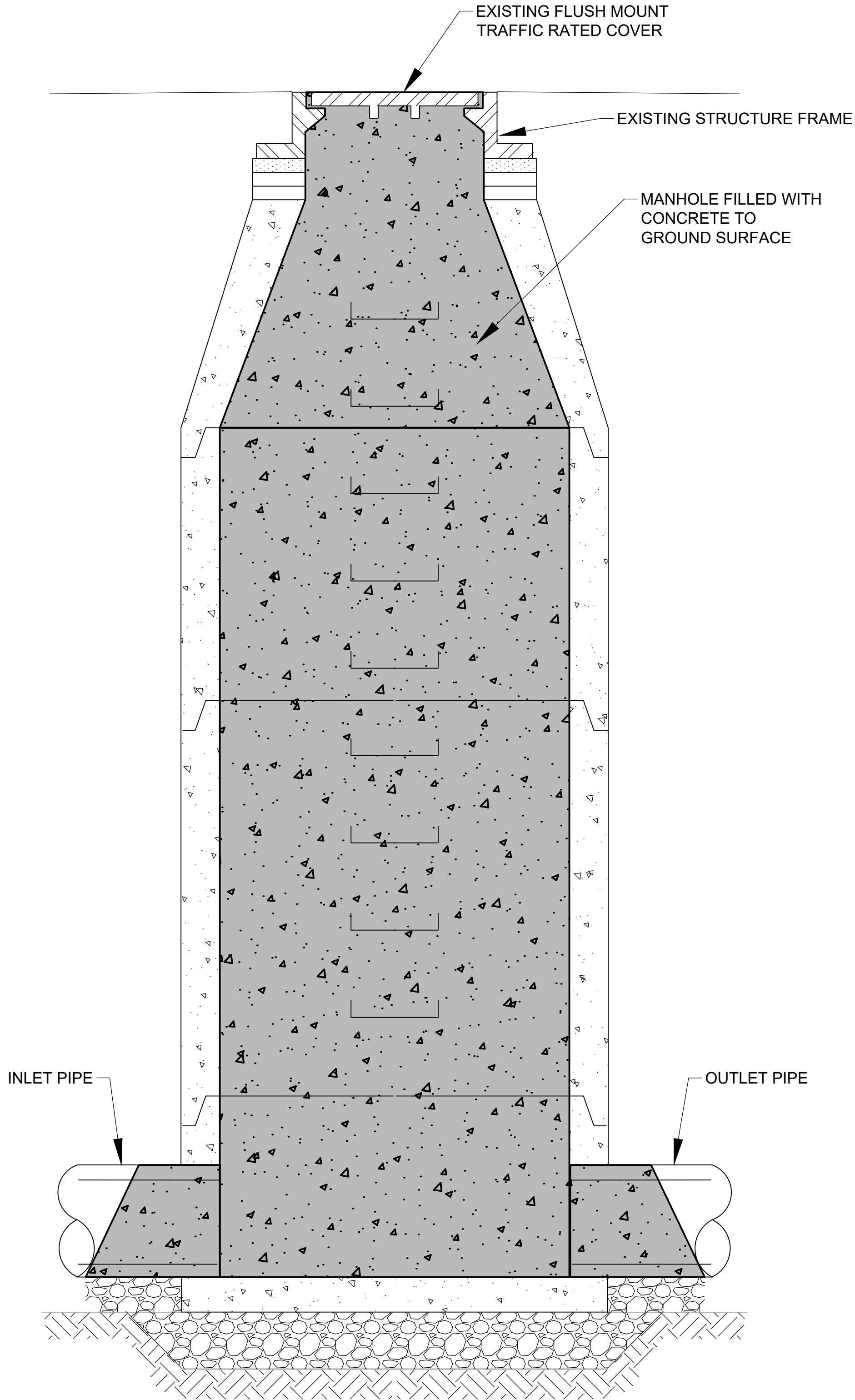
CITY: DIV/GRPUP: DS: A.SANCHEZ LD: PIC: PM: R.CHRISTENSEN TM: LYBON+ OFF+REF-
C:\Users\mueler\BIM\360\Arcadis\BIM - RACER TRUST\TRACER LANSING PLANTS 2\3.66\2020\30\04\287\201-DWG\RTLP236-MH-CB CAP DETAILS.dwg LAYOUT: 7 SAVED: 3/8/2021 9:59 AM ACADVER: 22.05 (LMS TECH) PAGES: 7 PLOTSETUP: --- PLOTSTYLETABLE: --- PLOTTED: 3/8/2021 10:08 AM BY: MUELLER, TM
PROJECTNAME: ---
IMAGES: ---
XREFS: X-RT-LP236-PFAS
X-RT-LP236-BDR-CLD



TYPICAL CATCH BASIN CAP DETAIL

1" = 1'-0"

- LEGEND:
- CONCRETE
 - GRAVEL FILL
 - PRECAST CONCRETE
 - UNDISTURBED SOIL
- EX. EXISTING
- GA. GAUGE
- GALV. GALVANIZED
- PVC POLYVINYL CHLORIDE
- MIL MILLIMETER



TYPICAL STRUCTURE FILLED WITH CONCRETE

1" = 1'-0"

SCALE(S) AS INDICATED	
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
2	02.25.2021	RECORD DRAWING	TM	AL
1	05.11.2018	PRELIMINARY DRAFT DESIGN	EF	AL
THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.				

Professional Engineer's Name		
JACELYN SALING		
Professional Engineer's No.		
6201054715		
State	Date Signed	Project Mgr.
MI		R.CHRISTENSEN
Designed by	Drawn by	Checked by
E.FEENSTRA	A.SANCHEZ	A.LORENZ



Design & Consultancy
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built assets

ARCADIS OF MICHIGAN, LLC.

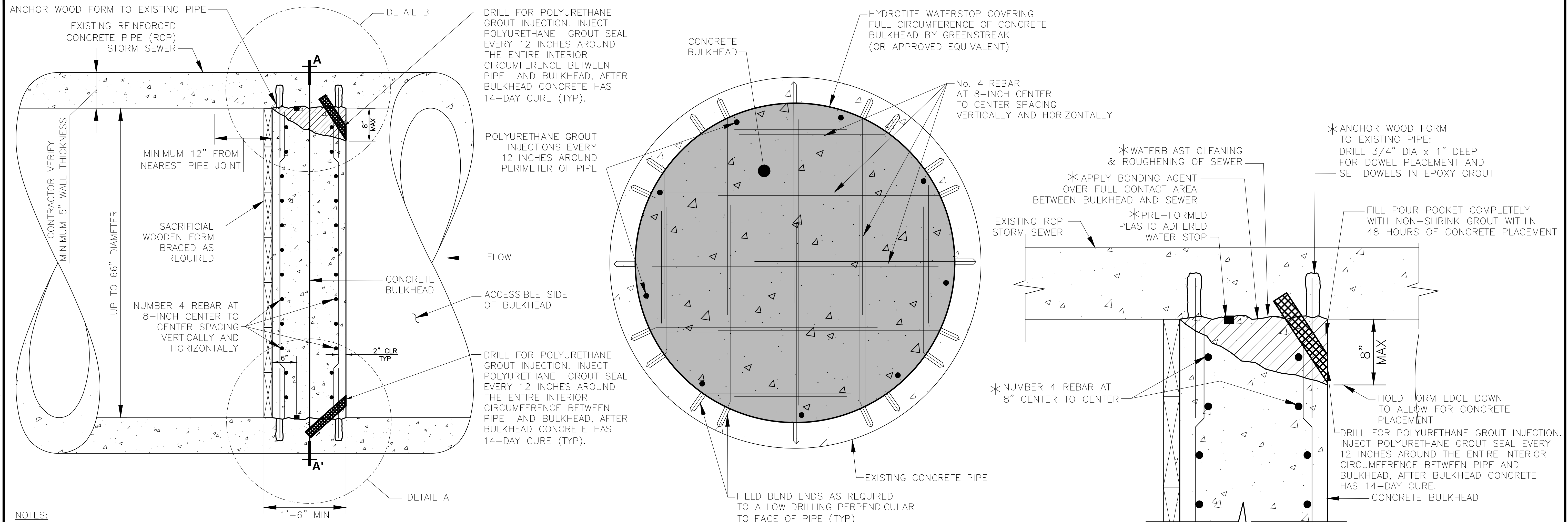
RACER TRUST • INDUSTRIAL LAND, LANSING, MICHIGAN

TYPICAL STRUCTURE FILL AND CATCH BASIN CAP DETAILS

ARCADIS Project No.
30075941.03600

Date
FEBRUARY 2021

ARCADIS
28550 CABOT DRIVE
SUITE 500
NOVI, MICHIGAN 48377
TEL. 248.994.2240



1. CONTRACTOR MUST STOP ALL PIPE FLOW IN ORDER TO CLEAN AND PREPARE SEWER FOR BOND AGENT. MAINTAIN ZERO FLOW UNTIL CONCRETE HAS REACHED FULL STRENGTH (MINIMUM 28 DAY).
2. ASSUMES PIPE IS CONCRETE. IF PIPE MATERIAL IS DIFFERENT OR IN UNACCEPTABLE CONDITION, CONTACT ENGINEER.

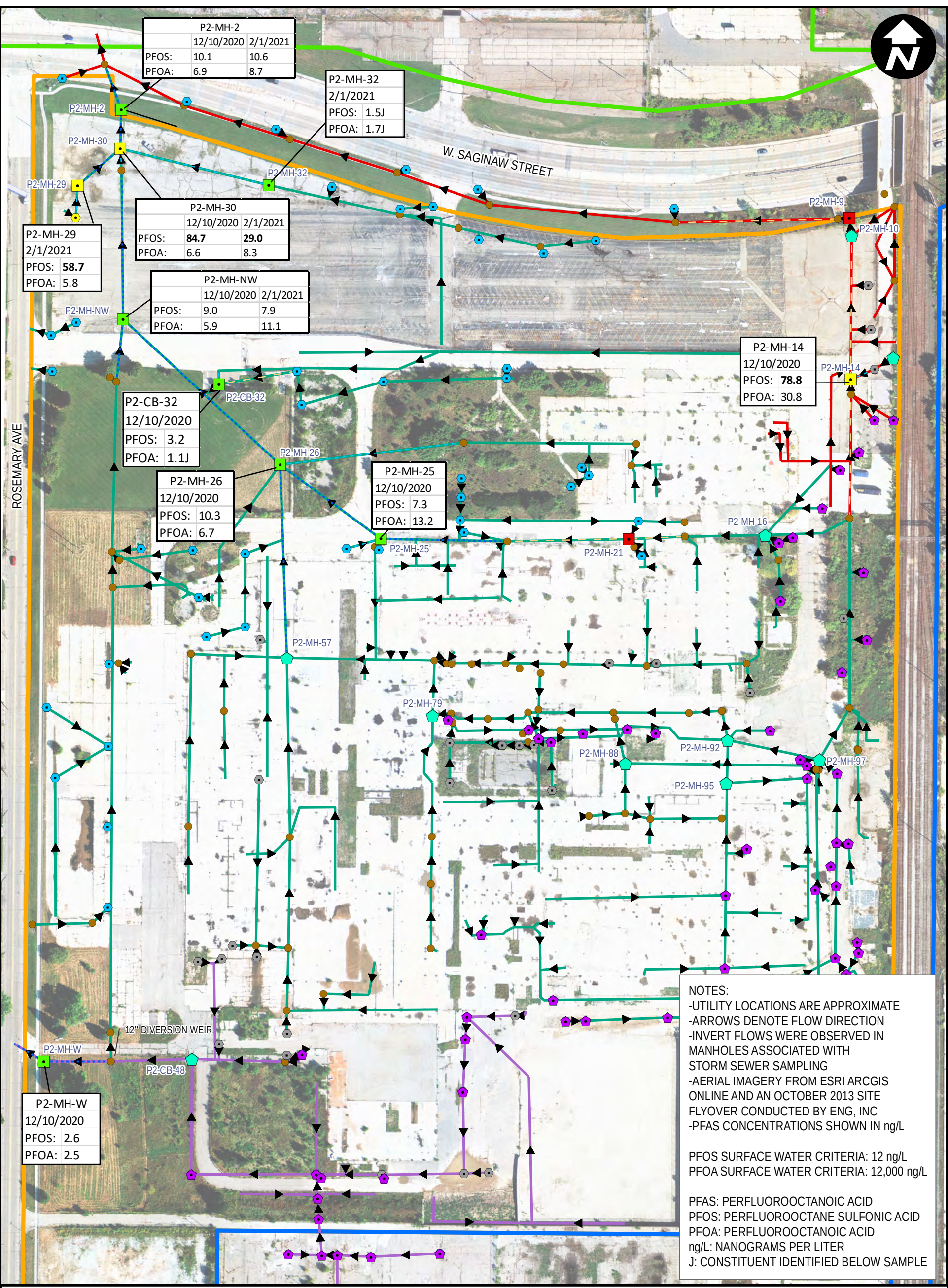
✱ FULL CIRCUMFERENCE OF BULKHEAD.

TYPICAL BULKHEAD SECTION FOR UP TO 66" PIPE



SCALE(S) AS INDICATED						Professional Engineer's Name JACELYN SALING			 ARCADIS Design & Consultancy for natural and built assets	RACER TRUST • INDUSTRIAL LAND, LANSING, MICHIGAN	ARCADIS Project No. 30075941.03600	8
						Professional Engineer's No. 6201054715					Date FEBRUARY 2021	
	2	02.25.2021	RECORD DRAWING		TM	AL	State MI	Date Signed			Project Mgr. R. CHRISTENSEN	
	1	05.11.2018	PRELIMINARY DRAFT DESIGN		DS	AL	Designed by D. STOCKARD	Drawn by A. SANCHEZ			Checked by A. LORENZ	
	No.	Date	Revisions			By	Ckd	THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.				
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:		USE TO VERIFY FIGURE REPRODUCTION SCALE										

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TR: A. LORENZ PROJECT NUMBER: 30075941.03600 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl T:\ENV\RACER\Buoil\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 7 - Plant 2 PFAS Sampling Results_2020.mxd PLOTTED: 3/24/2021 12:01:32 PM BY: K.Pullen



NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-PFAS CONCENTRATIONS SHOWN IN ng/L

PFOS SURFACE WATER CRITERIA: 12 ng/L
PFOA SURFACE WATER CRITERIA: 12,000 ng/L

PFAS: PERFLUOROCTANOIC ACID
PFOS: PERFLUOROCTANE SULFONIC ACID
PFOA: PERFLUOROCTANOIC ACID
ng/L: NANOGRAMS PER LITER
J: CONSTITUENT IDENTIFIED BELOW SAMPLE

- ADJUSTMENT TYPE

 - FILLED STRUCTURE
 - CAPPED STRUCTURE
 - CATCH BASIN REMAINING OPEN
 - COULD NOT LOCATE STRUCTURE
 - CATCH BASIN TO BE CAPPED

STRUCTURES & SAMPLE POINTS

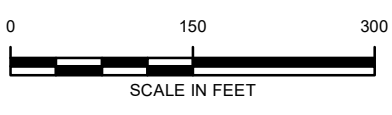
 - MANHOLE
 - MANHOLE ABOVE SURFACE WATER CRITERIA
 - MANHOLE BELOW SURFACE WATER CRITERIA
 - DRY MANHOLE
- PLANT 2 DRAINAGE NETWORKS

 - NORTHEAST (PARTIALLY ABANDONED)
 - CENTRAL (PARTIALLY ABANDONED)
 - SOUTHWEST (ABANDONED)

OBSERVED FLOW

 - NO FLOW
 - TRICKLE (~1 GPM OR LESS)
 - LITTLE (~1-3 GPM)
- PLANT BOUNDARIES

 - PLANT 2
 - PLANT 3
 - PLANT 6



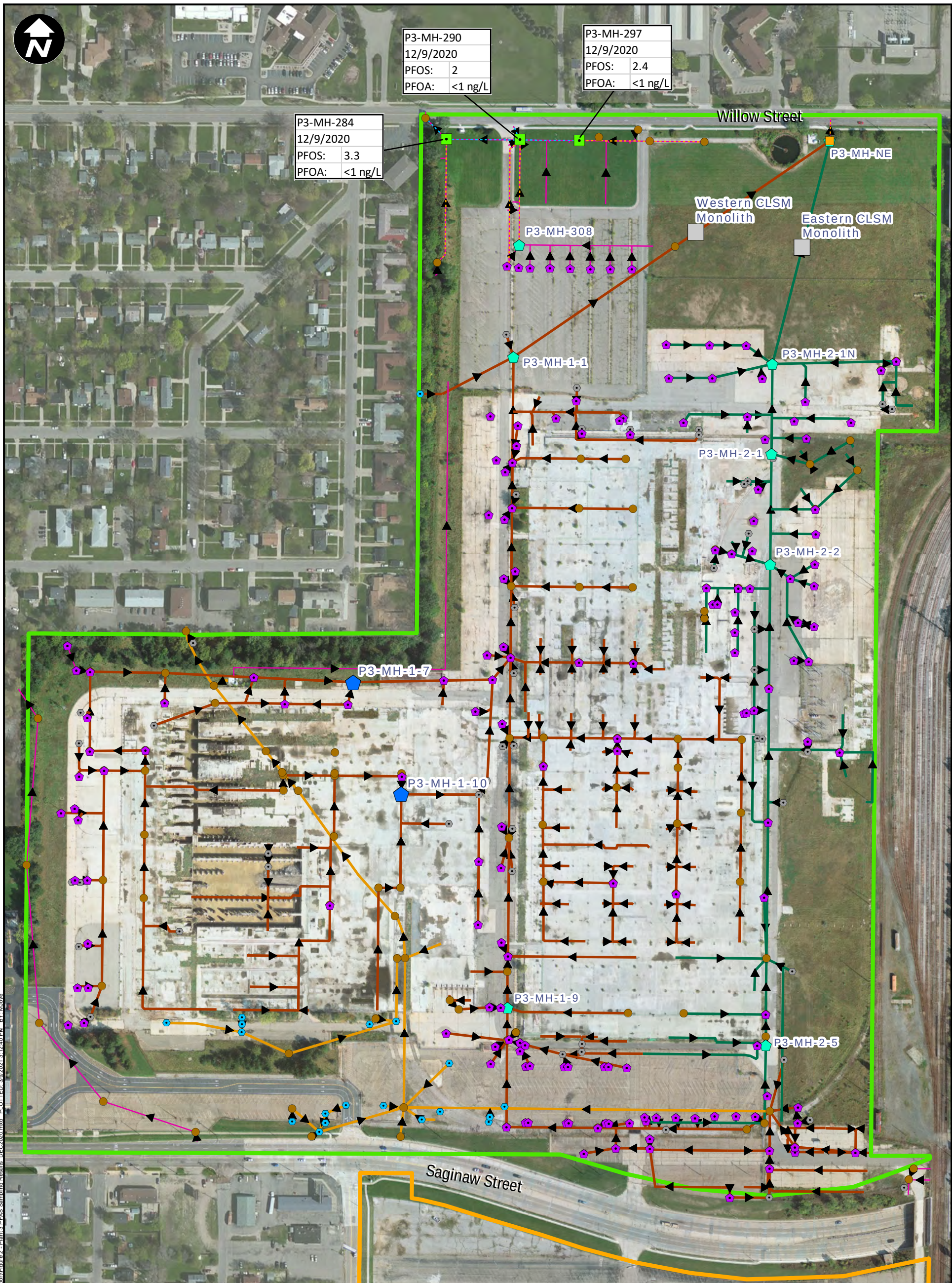
RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

DECEMBER 2020 / FEBRUARY 2021
PLANT 2 SAMPLING RESULTS

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built assets

FIGURE
9

CITY: NOV 1 DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
FILE: ENV\GACR\Bulfa\MapDocs\2020 P2 p3 p6 Storm Sewer Modifications Compilation Report\Figure 2 - Plant 3 PFAS Sampling Results DEC2020.mxd PLOTTED: 3/9/2021 3:12:40 PM BY: M.love



- FILLED STRUCTURE
 - CAPPED STRUCTURE
 - CLSM MONOLITH
 - BULKHEAD
 - DISCHARGE OPEN WITH CUSTOM POUR
- STRUCTURES & SAMPLE POINTS
- MANHOLE
 - MANHOLE COULD NOT BE LOCATED
 - CATCH BASIN REMAINING OPEN
 - CATCH BASIN COULD NOT BE LOCATED
 - MANHOLE BELOW SURFACE WATER CRITERIA

- PLANT 3 DRAINAGE NETWORKS
- COUNTY MAIN (ACTIVE)
 - EAST MAIN (ABANDONED)
 - WEST MAIN (ABANDONED)
 - OTHER (ACTIVE)
- OBSERVED FLOW
- NO FLOW
 - TRICKLE (~1 GPM OR LESS)
- PLANT BOUNDARIES
- PLANT 2
 - PLANT 3

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC

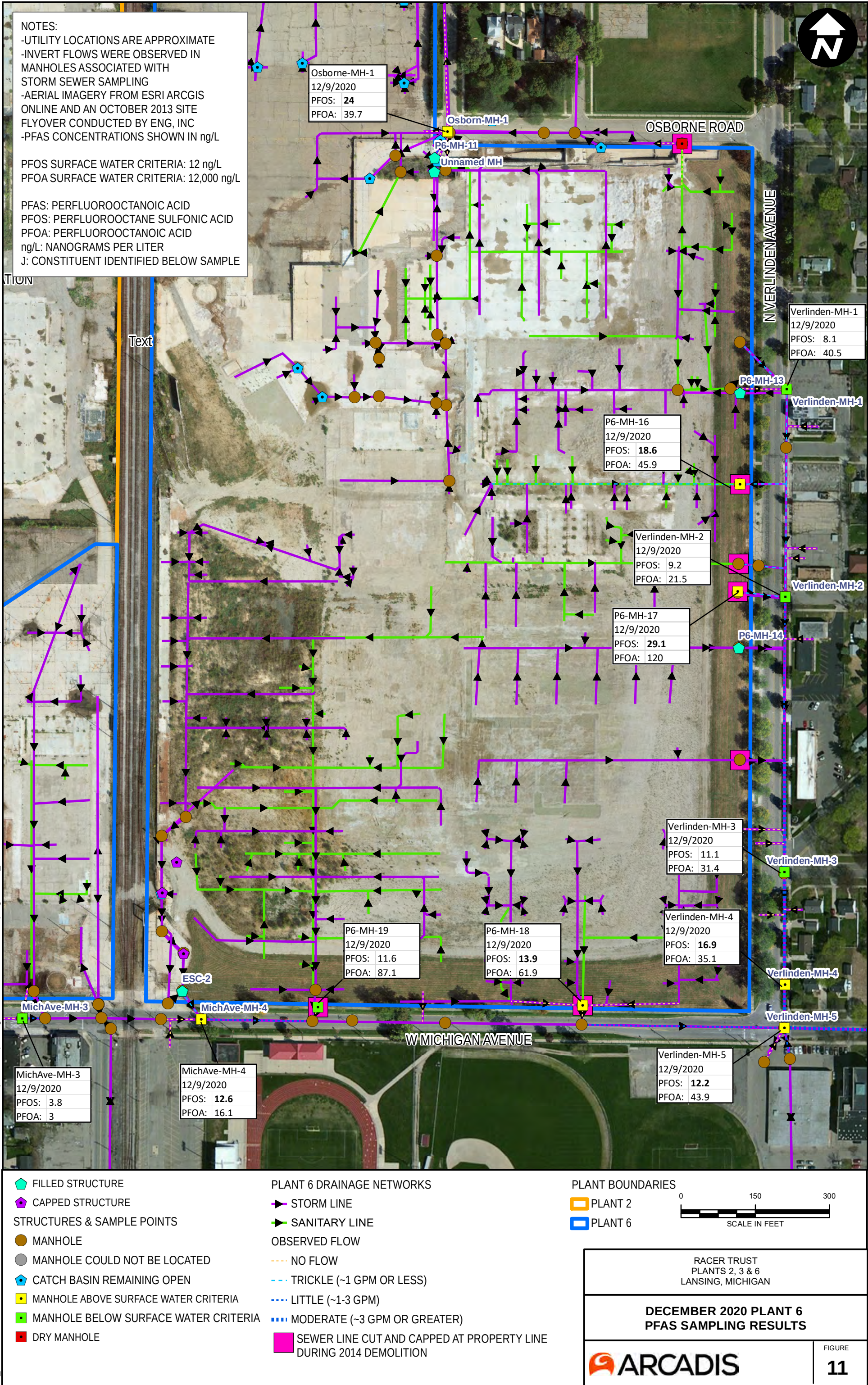


RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

DECEMBER 2020 PLANT 3 PFAS SAMPLING RESULTS



CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Burl\Info\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 11 - Plant 6 PFAS Sampling Results_DEC2020.mxd PLOTTED: 3/9/2021 9:15:27 AM BY: M.Joye



APPENDIX A

Field Notes



TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing	Project Location: Lansing, MI
Project Number: 30042872	Date: 11/02/2020
	Time: 08:26
Conducted By: M. Samp	Signature: <i>M. Samp</i>

Client and Sub-Contractore details

Client Name: RACER Trust	Client Contact: Dave Favero	Sub-Contractore Companies: JSS, Young's

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Site walk, set up for sewer mods

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☐

None ☒

Describe them here and how will they be controlled? _____

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable <u>Doc #</u>	☐ Working at Height <u>Doc #</u>	☐ Confined Space <u>Doc #</u>
☐ Energy Isolation (LOTO) <u>Doc #</u>	☐ Excavation/Trenching <u>Doc #</u>	☐ Hot Work <u>Doc #</u>
☐ Mechanical Lifting Ops <u>Doc #</u>	☐ Overhead & Buried Utilities <u>Doc #</u>	☐ Other permit <u>Doc #</u>

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JLAs or procedures are available?	☐ Field teams to "dirty" JLAs, as needed?	☐ If deviations, notify PM & client
☐ Staff has appropriate PPE?	☐ Staff knows Emergency Plan (EAP)?	☐ All equipment checked & OK?
		☐ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L M H)	☒ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAs, and other control processes. Discuss and document any additional control processes.

☒ STOP WORK AUTHORITY (Must be addressed in every Tailgate meeting - (See statements below)		
☐ Elimination	☐ Substitution	☐ Isolation
☐ Engineering controls	☐ Administrative controls	☐ Monitoring

☐ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☐ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☐ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Marina Samp	Arcadis	Oversight		08:00	16:00	yes
Allyson Hartz	Arcadis	Oversight		08:10	16:00	yes
Anyssa Mandich	Arcadis	Oversight		08:00	16:30	yes
Tom Holdeman	JSS	Site walk		08:00	11:40	yes
Justin Wackerly	JSS	Sewer mods		08:20	16:30	yes
Justin Schmidt	JSS	Sewer mods		08:20	16:30	yes
Ken Sholes	Young's	Manhole cleaning		08:15	14:00	yes
Jesse Mitchell	Young's	Manhole cleaning		08:15	14:00	yes
Aaron Misciski	JSS	CSE Inspections		13:00	14:45	yes
Visitor Name/Co - not involved in work			In Time	Out Time		

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

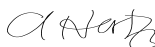
Overall Comments:

Daily Log

Project Name : RACER Lansing
Project Number : 30042872
Purpose : Sewer Modifications
PPE : Level D
Equipment:

Weather(°F) : 30 cloudy
Prepared By: Allyson Hartz

Date	Time	Description of Activities
11/02/2020	08:00	Arcadis, JSS, and Young's onsite
11/02/2020	08:30	H&S tailgate, self assessments
11/02/2020	08:45	Begin site walk through with JSS and Young's
11/02/2020	09:45	Young's mobilizes to begin cleaning manholes, starting with P2-SAN-3-7
11/02/2020	10:17	Finish cleaning P2-SAN-3-7, start cleaning P2-MH-10
11/02/2020	10:27	Finish P2-MH-10, mobilize to Plant 3
11/02/2020	10:39	Start cleaning P3-MH-308
11/02/2020	11:09	Finish cleaning P3-MH-308, mobilize back to Plant 2
11/02/2020	11:24	Start cleaning P2-MH-16
11/02/2020	11:30	Dewatering box arrives
11/02/2020	11:43	Finish cleaning P2-MH-16
11/02/2020	11:52	Start cleaning P2-MH-79
11/02/2020	12:06	Finish cleaning P2-MH-79
11/02/2020	12:07	Start cleaning P2-MH-57
11/02/2020	12:32	Finish cleaning P2-MH-57
11/02/2020	13:38	Young's dewaterers and demobilizes
11/02/2020	13:45	JSS confined space entry into Plant 3 Sanitary Vault for measurements and photos
11/02/2020	14:06	JSS confined space entry into P2-MH-57 to retrieve broken manhole cover
11/02/2020	14:30	Young's offsite
11/02/2020	14:45	JSS begins putting collars and bentonite around spare points
11/02/2020	16:00	JSS and Arcadis offsite

Signature: 

Daily Log

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/02/2020	no					no				See tracker, used dewatering box

Other Photos



P3-MH-308



P2-MH-16



P2-MH-79



P2-SAN-3-7

Daily Log



P2-MH-57



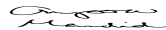
P2-MH-10

Daily Log

Project Name : RACER Lansing
Project Number : 30042872
Purpose : Sewer Modifications
PPE : Level D
Equipment:

Weather(°F) : Partly cloudy, 35°
Prepared By: Anyssa Mandich

Date	Time	Description of Activities
11/02/2020	08:00	Arcadis, JSS, Young's on site
11/02/2020	08:15	H&S tailgate
11/02/2020	08:40	Begin site walk of Plant 3 locations
11/02/2020	09:00	Begin site walk of plant 2 locations
11/02/2020	09:45	Young's began cleaning P2-SAN-3-7
11/02/2020	09:50	A. Mandich took JSS to Plant 2 to show them well vault locations for well lids.
11/02/2020	10:05	Alro Steel on site to drop off JSS materials
11/02/2020	10:15	JSS removed casting surrounding P2-MH-57 and removed the cracked manhole cover. About 2/3 of the cover fell into the manhole. JSS will remove the portion of the lid prior to filling.
11/02/2020	11:00	JSS off site to obtain materials for capping and well vault lids
11/02/2020	11:25	Young's began cleaning P2-MH-16
11/02/2020	11:40	T. Holdeman off site
11/02/2020	12:05	A. Mandich off site to print updated Plant 2 figure
11/02/2020	12:30	Young's finished cleaning P2-MH-57
11/02/2020	13:00	Young's emptied into dewatering box
11/02/2020	13:40	JSS performed CSE into Plant 3 vault
11/02/2020	14:00	JSS recovered the pieces of broken manhole lid
11/02/2020	14:40	JSS began well vault sealing
11/02/2020	15:50	JSS finished 10 of 16 seals
11/02/2020	16:00	M. Samp and A. Hartz off site. Leak tested unions. AS-19-G06 leak will be addressed tomorrow.
11/02/2020	16:25	Closed G06 and restarted system.
11/02/2020	16:30	JSS and A. Mandich off site

Signature: 

Daily Log

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/02/2020										

Other Photos



Well vault seal

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

Project Number: 30042872

Date: 11/03/2020

Time: 08:05

Conducted By: Anyssa Mandich

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Possible catch basin capping, removal of sand on top of CBs, possible plant 6 plugs, finish sealing of wellheads

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☒

None ☐

Describe them here and how will they be controlled?

VI installs are happening, but these will all be off site. Watch where you are driving to mitigate.

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAs or procedures are available?

☐ Field teams to "dirty" JLAs, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Drink lots of water. Use caution while driving around site and to/from Plants.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAs, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls

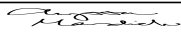
☐ Administrative controls

☐ Monitoring

☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		08:05		yes
Aaron Mosciski	JSS			08:30		yes
Justin Wackerle	JSS			08:05		yes
Mark Alm	JSS			08:30		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

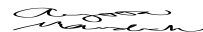
Overall Comments:

Daily Log

Project Name : RACER Lansing
Project Number : 30042872
Purpose : Sewer Modifications
PPE : Level D
Equipment:

Weather(°F) : Sunny, 40°
Prepared By: Anyssa Mandich

Date	Time	Description of Activities
11/03/2020	08:00	A. Mandich and J. Wackerle on site.
11/03/2020	08:05	H&S tailgate
11/03/2020	08:30	Aaron and Mark on site
11/03/2020	08:40	JSS addressed wellhead leaks. Off site to grab more bentonite.
11/03/2020	09:30	JSS finished last 6 well seals
11/03/2020	11:00	Leak tested 16 sealed well vaults.
11/03/2020	12:40	JSS covered rectangular catch basin with lid. We aren't going to be able to get a perfect seal on the cap due to the way the structure was built.
11/03/2020	12:50	JSS covered circular CB with missing lid
11/03/2020	14:25	Stone on site
11/03/2020	15:00	JSS and Arcadis off site

Signature: 

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/03/2020										

Daily Log

Other Photos



rectangular catch basin covered with lid



circular catch basin covered with lid



stone delivery ticket

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing

Project Number: 30042872

Date: 11/04/2020

Time: 08:55

Conducted By: Allyson Hartz

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Prepare catch basins for capping, uncover of dirt and sand

Think through the Tasks(List the tasks for the day):

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☐

None ☒

Describe them here and how will they be controlled?

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☐ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls

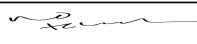
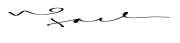
☐ Administrative controls

☐ Monitoring

☐ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☐ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☐ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Jacob	JSS			#Error		yes
Justin	JSS			#Error		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Overall Comments:

Daily Log

Project Name : RACER Lansing

Weather(°F) : 50 sunny

Project Number : 30042872

Prepared By: Allyson Hartz

Purpose : Sewer Modifications

PPE : Level D

Equipment:

Date	Time	Description of Activities
11/04/2020	08:45	Arcadis, JSS arrive onsite. H&S tailgate and self assessments
11/04/2020	09:30	JSS mobilize to begin uncovering and cleaning the lids of catch basins on Plant 2
11/04/2020	10:00	Start uncovering catch basins, preparing for caps
11/04/2020	10:45	Complete capping one catch basin
11/04/2020	10:54	Continue uncovering and cleaning off catch basins on Plant 2
11/04/2020	11:00	Complete second catch basin capping
11/04/2020	11:15	Continue uncovering catch basins at Plant 2, one is missing a lid, currently has a steel plate on top of it
11/04/2020	11:36	Finish uncovering catch basins, lunch
11/04/2020	12:39	Measured catch basin for fill estimate
11/04/2020	12:51	Measure catch basin diameter of the one missing its lid that was uncovered today
11/04/2020	18:00	Arcadis and JSS offsite

Signature: 

Waste Management:										
Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/04/2020	no					no				See tracker

Daily Log

Other Photos



first completed catch basin capping



uncovered catch basin lid



uncovered catch basin lid



uncovered catch basin lid



uncovered catch basin lid, steel plate covering
because missing lid



second completed catch basin capping

Daily Log



no lid under steel plate, 23.25 diameter

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

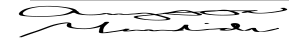
Project Number: 30042872

Date: 11/05/2020

Time: 07:25

Conducted By: Anyssa Mandich

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Catch basin capping, manhole filling

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☒

None ☐

Describe them here and how will they be controlled? VI installs are happening, but these will all be off site. Watch where you are driving to mitigate.

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Direct concrete truck across site in preferred driving paths and keep head on a swivel as they are pouring/moving/cleaning out. Drink lots of water. Use caution while driving around site and to/from Plants.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls	☐ Administrative controls	☐ Monitoring
☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		07:25		yes
Justin Wackerle	JSS			07:25		yes
Jacob Schmidt	JSS			07:25		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

- All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
- In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
- In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
- In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

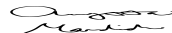
Overall Comments:

Daily Log

Project Name : RACER Lansing
Project Number : 30042872
Purpose : Sewer Modifications
PPE : Level D
Equipment:

Weather(°F) : Cloudy, 56°
Prepared By: Anyssa Mandich

Date	Time	Description of Activities
11/05/2020	07:15	Anyssa Mandich on site
11/05/2020	07:20	Met JSS at Plant 3 gate
11/05/2020	07:25	H&S tailgate
11/05/2020	08:05	JSS began filling P3-MH-308 with concrete
11/05/2020	08:35	JSS finished filling P3-MH-308. Used vibrator to remove air pockets
11/05/2020	08:45	JSS filled the catch basin laid in curb with concrete
11/05/2020	08:55	JSS began filling P2-MH-16 with concrete
11/05/2020	09:05	JSS finished filling P2-MH-16. Used vibrator to remove air pockets
11/05/2020	09:15	JSS began filling P2-MH-79 with concrete
11/05/2020	10:10	JSS finished filling P2-MH-79. Used vibrator to remove air pockets
11/05/2020	10:15	JSS began filling P2-MH-57 with concrete
11/05/2020	11:00	Poly liner arrived
11/05/2020	11:35	JSS finished filling P2-MH-79. Used vibrator to remove air pockets
11/05/2020	11:45	JSS began filling P2-MH-10
11/05/2020	12:15	JSS finished filling P2-MH-10. Used vibrator to remove air pockets. Began filling P2-SAN-3-7
11/05/2020	12:55	JSS finished filling P2-SAN-3-7. Used vibrator to remove air pockets
11/05/2020	13:15	JSS installed poly liners and metal sheets on the 8 Plant 3 capping locations
11/05/2020	14:10	JSS began covering Plant 3 capping locations with gravel
11/05/2020	14:45	JSS finished covering catch basins on Plant 3
11/05/2020	15:00	JSS began capping Plant 2 locations
11/05/2020	16:25	JSS finished capping 10 Plant 2 locations
11/05/2020	16:40	JSS and Arcadis off site

Signature: 

Daily Log

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/05/2020										

Other Photos



P2-MH-79 filled



P2-MH-10 filled



Filled catch basin



P2-MH-16 filled

Daily Log



P2-MH-79 filled



P3-MH-308 filled



P2-SAN-3-7 filled

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

Project Number: 30042872

Date: 11/06/2020

Time: 08:00

Conducted By: Anyssa Mandich

Signature:

Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Catch basin capping

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☒

None ☐

Describe them here and how will they be controlled?

VI installs are happening, but these will all be off site. Watch where you are driving to mitigate.

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ L Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ L Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ L Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ L Personal (i.e. alone, night, not fit) (L M H)	☐ H Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Direct concrete truck across site in preferred driving paths and keep head on a swivel as they are pouring/moving/cleaning out. Drink lots of water. Use caution while driving around site

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls

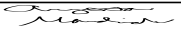
☐ Administrative controls

☐ Monitoring

☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		08:00		yes
Justin Wackerle	JSS			08:00		yes
Jacob Schmidt	JSS			08:00		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Overall Comments:

Daily Log

Project Name : RACER Lansing

Weather(°F) : Sunny, 50°

Project Number : 30042872

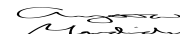
Prepared By: Anyssa Mandich

Purpose : Sewer Modifications

PPE : Level D

Equipment:

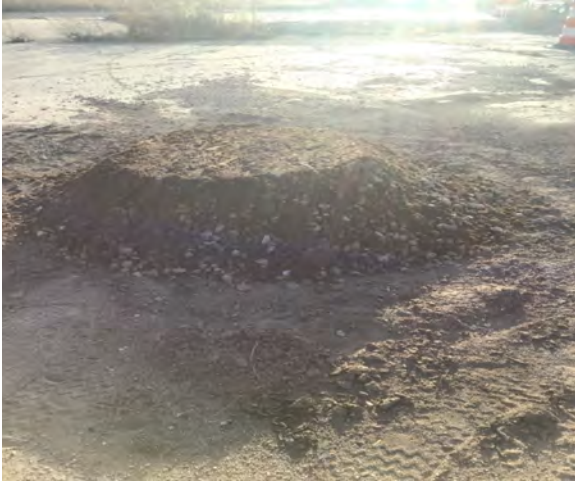
Date	Time	Description of Activities
11/06/2020	07:55	Anyssa Mandich and JSS on site
11/06/2020	08:00	H&S tailgate
11/06/2020	08:15	JSS began capping catch basins. One was midflagged. It is a filled rectangular grate. Made note on figure.
11/06/2020	08:30	Young's on site for trash roll off. JSS scraped off what we thought was debris on top of a catch basin. There was no CB found. Circled missing CBs on figure
11/06/2020	09:30	JSS finished capping 5 catch basins. One CB left that needs lid.
11/06/2020	09:40	JSS took equipment back to Sunbelt
11/06/2020	10:00	JSS waited to see if they could get a lid for the last catch basin
11/06/2020	10:15	Young's back on site with new trash roll off
11/06/2020	13:40	JSS capped the final catch basin after obtaining lid
11/06/2020	14:05	Arcadis and JSS off site

Signature: 

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/06/2020										

Other Photos



Catch basin cap

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

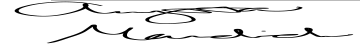
Project Number: 30042872

Date: 11/09/2020

Time: 09:45

Conducted By: Anyssa Mandich

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Plant 6 plugging, Plant 3 bulkhead/form preparation

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☐

None ☒

Describe them here and how will they be controlled?

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Drink lots of water. Use caution while driving around site and to and from Plants.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls

☐ Administrative controls

☐ Monitoring

☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		09:45		yes
Jacob Schmidt	JSS			11:00		yes
Christ Alamanteoff	JSS			09:45		yes
Don Winchell	JSS			10:15		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Overall Comments:

Daily Log

Project Name : RACER Lansing

Weather(°F) : Sunny, 63°

Project Number : 30042872

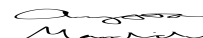
Prepared By: Anyssa Mandich

Purpose : Sewer Modifications

PPE : Level D

Equipment:

Date	Time	Description of Activities
11/09/2020	09:30	Anyssa Mandich on site
11/09/2020	09:45	Christ (JSS) on site
11/09/2020	10:00	Bentley Environmental on site to remove water from bottom of dewatering box
11/09/2020	10:45	Bentley off site
11/09/2020	10:50	The rest of JSS crew arrived on site
11/09/2020	11:00	H&S tailgate
11/09/2020	11:10	JSS began unloading materials for Plant 3 bulkhead
11/09/2020	11:30	JSS began preparing vault for bulkhead
11/09/2020	13:00	JSS began installing the back form inside the vault
11/09/2020	15:00	JSS began installing rebar for the back form
11/09/2020	16:45	JSS finished installing rebar for back form
11/09/2020	17:00	Arcadis and JSS off site

Signature: 

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/09/2020										

Daily Log

Other Photos



Back form



Back form with rebar

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

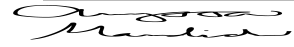
Project Number: 30042872

Date: 11/10/2020

Time: 07:05

Conducted By: Anyssa Mandich

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Plant 6 plugging, Plant 3 bulkhead/form preparation

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☒

None ☐

Describe them here and how will they be controlled?

Clearing is currently happening so cars can be brought on site. Watch where you're driving while driving in that area

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Drink lots of water. Use caution while driving around site.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls

☐ Administrative controls

☐ Monitoring

☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		07:05		yes
Jacob Schmidt	JSS			07:05		yes
Christ Alamanteoff	JSS			07:05		yes
Don Winchell	JSS			07:05		yes
Aaron Mosciski	JSS			09:15		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Overall Comments:

Daily Log

Project Name : RACER Lansing

Weather(°F) : Cloudy, 66°

Project Number : 30042872

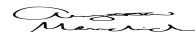
Prepared By: Anyssa Mandich

Purpose : Sewer Modifications

PPE : Level D

Equipment:

Date	Time	Description of Activities
11/10/2020	07:00	Anyssa Mandich on site. JSS already on site.
11/10/2020	07:05	H&S tailgate
11/10/2020	07:30	Consulted with Team to see if they wanted back form rebar to be doubled up. They confirmed it will be doubled.
11/10/2020	07:35	JSS began installing second layer of rebar, bonding agent, and Water stop
11/10/2020	09:15	Aaron Mosciski on site
11/10/2020	12:30	JSS finished building the form. Off site for lunch and to get vibrator for concrete pour
11/10/2020	13:35	JSS packed up their equipment before mobilizing to Plant 6. Aaron off site
11/10/2020	13:55	Mob to Plant 6
11/10/2020	14:15	JSS pumped down Osborn-CB-1 and plugged its inlet pipe
11/10/2020	14:30	Contacted M. Samp to verify which pipes we are plugging
11/10/2020	14:40	JSS plugged western HDPE pipe in Osborn-MH-1
11/10/2020	15:40	JSS plugged pipe coming from P6-MH-11 in Osborn-MH-1 since there was a trickle.
11/10/2020	16:00	Contacted M. Samp regarding final southern manhole pipe and where to pump water. We decided to hold off plugging until tomorrow and attempt to pump into a nearby catch basin
11/10/2020	16:20	Arcadis and JSS off site

Signature: 

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/10/2020										

Daily Log

Other Photos



Bonding agent



Plugged southwestern pipe Osborn-MH-1 coming from P6-MH-11 that was trickling



Plugged western HDPE pipe Osborn-MH-1



Osborn-CB-1 inlet plugged



Second layer of rebar



Bonding agent

Daily Log



Completed form



Completed form

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

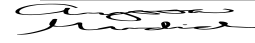
Project Number: 30042872

Date: 11/11/2020

Time: 07:05

Conducted By: Anyssa Mandich

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Plant 6 plugging, Plant 3 bulkhead pour, CCTV

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☒

None ☐

Describe them here and how will they be controlled?

Clearing is currently happening so cars can be brought on site. Watch where you're driving while driving on Plant 3

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Drink lots of water. Use caution while driving around site. Do not exit vehicle for CCTV until Spartan gives us the all clear.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls	☐ Administrative controls	☐ Monitoring
☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		07:05		yes
Jacob Schmidt	JSS			07:05		yes
Christ Alamanteoff	JSS			07:05		yes
Don Winchell	JSS			07:05		yes
Allyson Hartz	Arcadis			08:00		yes

Visitor Name/Co - not involved in work	In Time	Out Time

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Overall Comments:

Daily Log

Project Name : RACER Lansing

Weather(°F) : Cloudy, 41°

Project Number : 30042872

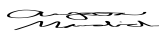
Prepared By: Anyssa Mandich

Purpose : Sewer Modifications

PPE : Level D

Equipment:

Date	Time	Description of Activities
11/11/2020	06:55	Anyssa Mandich on site. JSS and Slifco already on site. Drove Slifco to Plant 2 system
11/11/2020	07:05	H&S tailgate
11/11/2020	07:20	Mobilized to Plant 6 for plugging
11/11/2020	07:35	JSS pumped down Osborn-CB-1 into neighboring catch basin
11/11/2020	07:40	JSS began pumping water out of Osborn-MH-1 in order to access southern pipe. A. Hartz on site.
11/11/2020	07:45	M. Samp called and advised that Young's had been pushed back again
11/11/2020	08:00	A. Mandich mobilized to Plant 2 gate to meet Spartan Barricade and notify them that work had been cancelled
11/11/2020	08:30	A. Mandich off site

Signature: 

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/11/2020										

Other Photos



Southern pipe plug Osborn-MH-1

Daily Log

Project Name : RACER Lansing

Weather(°F) : 30 cloudy

Project Number : 30042872

Prepared By: Allyson Hartz

Purpose : Sewer Modifications

PPE : Level D

Equipment:

Date	Time	Description of Activities
11/11/2020	07:45	Arrive onsite
11/11/2020	08:00	JSS pumping water out of Osborn-MH-1
11/11/2020	08:30	JSS begin plugging pipe in Osborn-MH-1
11/11/2020	10:00	Finish plugging pipe, demobilize and go to Plant 3 Sanitary Vault for concrete pour
11/11/2020	12:58	Pump truck arrives at Plant 3 Sanitary Vault
11/11/2020	13:53	Concrete truck arrives at Plant 3 Sanitary Vault
11/11/2020	14:15	Finish pouring concrete at Plant 3 Sanitary Vault, pump truck and concrete truck washout
11/11/2020	14:45	Concrete truck and pump truck offsite
11/11/2020	16:15	Arcadis and JSS offsite

Signature:



Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/11/2020	no					no				See tracker

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing

Project Location: Lansing, MI

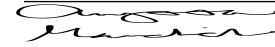
Project Number: 30042872

Date: 11/12/2020

Time: 06:55

Conducted By: Anyssa Mandich

Signature:



Client and Sub-Contractore details

Client Name: RACER Trust

Client Contact: Dave Favero

Sub-Contractore Companies: JSS

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): Plant 3 bulkhead form removal

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☒

None ☐

Describe them here and how will they be controlled?

Clearing is currently happening so cars can be brought on site. Watch where you're driving while driving on Plant 3

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable

Doc #

☐ Working at Height

☐ Confined Space

☐ Energy Isolation (LOTO)

☐ Excavation/Trenching

☐ Hot Work

☐ Mechanical Lifting Ops

☐ Overhead & Buried Utilities

☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?

☐ Lessons learned from the day before?

☐ Topics from Corp H&S to cover?

☐ Any corrective actions from yesterday?

☐ Will any work deviate from plan?

☐ Any Stop Work Interventions yesterday?

☐ JLAS or procedures are available?

☐ Field teams to "dirty" JLAS, as needed?

☐ If deviations, notify PM & client

☐ Staff has appropriate PPE?

☐ Staff knows Emergency Plan (EAP)?

☐ All equipment checked & OK?

☐ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☒ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☒ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Watch your footing across uneven surfaces. Dress accordingly for the weather and take breaks as needed. Drink lots of water. Use caution while driving around site.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☒ Elimination

☐ Substitution

☐ Isolation

☐ Engineering controls

☐ Administrative controls

☐ Monitoring

☒ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☒ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☒ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Anyssa Mandich	Arcadis	Environmental Engineer		06:55		yes
Jacob Schmidt	JSS			06:55		yes
Christ Alamanteoff	JSS			06:55		yes
Don Winchell	JSS			06:55		yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

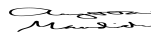
Overall Comments:

Daily Log

Project Name : RACER Lansing
 Project Number : 30042872
 Purpose : Sewer Modifications
 PPE : Level D
 Equipment:

Weather(°F) : Clear, 30°
 Prepared By: Anyssa Mandich

Date	Time	Description of Activities
11/12/2020	06:50	Anyssa Mandich and JSS on site
11/12/2020	06:55	H&S tailgate
11/12/2020	07:30	JSS began removing the form from the Plant 3 vault
11/12/2020	09:00	Arcadis and JSS off site

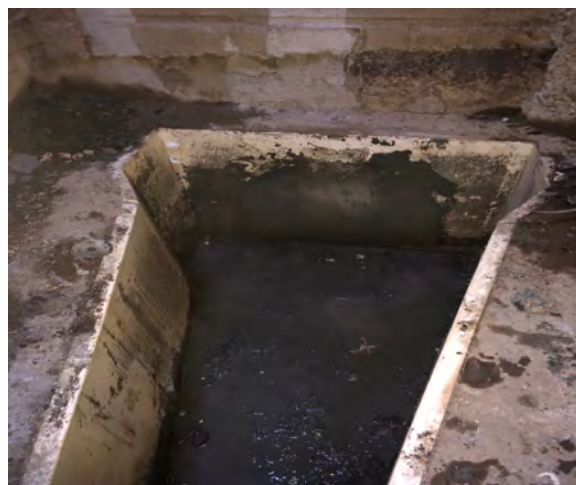
Signature: 

Waste Management:										
Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
11/12/2020										

Other Photos



Plant 3 vault bulkhead with form removed



Plant 3 vault bulkhead with form removed

RACER Lansing, 2020-12-16

Created	2020-12-16 07:48:35 EST by Anyssa Mandich
Updated	2020-12-16 07:56:23 EST by Anyssa Mandich
Location	,
Unique Survey ID	30042872-20201216

TAILGATE HEALTH & SAFETY MEETING FORM This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Details

Project Name	RACER Lansing
Project Location	Lansing, MI
Project Number	30042872
Date	2020-12-16
Time	07:50
Conducted By	Anyssa Mandich
Signature	



Signed 2020-12-16 07:48:58 EST

Client and Sub-contractor details

Client Name	RACER Trust
Client Contact	Dave Favero
Sub-contractor Companies	Spartan Barricade, Young's

Tracking the Tailgate Meeting

Think - through the Tasks

List the tasks for the day	CCTV

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

None

Pework Authorization (Check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins)

Pework Authorization Applicable

Activities

Other Permit Yes

Document # - Other Permit ROW Permit 2020-000778

Recognize the hazards (select all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - select risk level) - Provide an overall assessment of hazards to be encountered today and briefly discuss them at the bottom.

Motion (i.e., traffic, moving water) Low

Environmental (i.e., weather, hot/cold surfaces, water bodies) Low

Driving (i.e. car, ATV, boat, dozer) High

Provide Description of Assessing the Risks Do not exit vehicle until Spartan Barricade gives us the clear. Dress appropriately for the weather and take breaks as needed. Use proper lifting techniques when removing lids.

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

Hazard Controls Discussed STOP WORK AUTHORITY, Engineering controls, General PPE Usage, Personal Hygiene, Decon Procedures, Monitoring

Anyssa Mandich

Name Anyssa Mandich

Company Arcadis

Employee Task Environmental Engineer

Sign In Time 07:50

I have read and understand the daily H&S documents Yes

Christopher Thomas

Name Christopher Thomas

Company Spartan Barricade

Sign In Time 07:50

I have read and understand the daily H&S documents Yes

Mike Smith

Name Mike Smith

Company Young's

Sign In Time 07:50

Joe Martin

Name	Joe Martin
Company	Young's
Sign In Time	07:50
I have read and understand the daily H&S documents	Yes

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Important Information and Numbers: 1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns. 2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager. 3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager. 4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment. I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments. If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed. I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Daily Log

Project Name : RACER Lansing

Weather(°F) : Cloudy, 24°

Project Number : 30042872

Prepared By: Anyssa Mandich

Purpose : CCTV

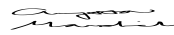
PPE : Level D

Equipment:

Date	Time	Description of Activities
12/16/2020	07:45	Anyssa Mandich on site. Spartan Barricade and Young's on site
12/16/2020	07:50	H&S tailgate
12/16/2020	08:00	Spartan Barricade set up signs along Verlinden and Michigan
12/16/2020	08:35	Young's began CCTV starting at MichAve-MH-3 toward MichAve-MH-5
12/16/2020	08:40	Encountered lots of debris. Pulled out rover to try larger one.
12/16/2020	08:55	Large rover appears to be working well. Continued traveling downstream
12/16/2020	09:00	Encountered a pipe with a blockage after MichAve-MH-5. Had to pull rover out and place in MichAve-MH-6
12/16/2020	09:30	Rover got stuck going from MichAve-MH-6 to MichAve-MH-5 due to sediment levels.
12/16/2020	09:35	Began traveling from MichAve-MH-6 to MichAve-MH-7
12/16/2020	09:45	Had to pull rover out after encountering rocks and debris
12/16/2020	09:55	Began traveling from MichAve-MH-7 to MichAve-MH-6
12/16/2020	10:05	Rover could not travel farther due to rocks and sediment
12/16/2020	10:10	Began traveling from MichAve-MH-7 to MichAve-MH-4. Rover was flipped due to concrete in MichAve-MH-7. Young's had to perform CSE in order to remove the rover.
12/16/2020	10:30	Began traveling from MichAve-MH-4 to MichAve-MH-7
12/16/2020	10:40	Rover could not move farther due to rocks and sediment
12/16/2020	10:40	Began traveling from MichAve-MH-4 to MichAve-MH-8
12/16/2020	10:45	Ran into a bored pipe. Could not travel farther
12/16/2020	10:50	MichAve-MH-8 was inaccessible for the rover.
12/16/2020	11:00	Discovered a manhole between MichAve-MH-8 and MichAve-MH-9. Named it MichAve-MH-8A
12/16/2020	11:05	Began traveling from MichAve-MH-8A to MichAve-MH-8
12/16/2020	11:10	Pulled rover out after it encountered MichAve-MH-8 pipes
12/16/2020	11:20	Ran into sediment and debris and had to pull rover out.
12/16/2020	11:30	Young's took a lunch
12/16/2020	12:45	Sheen observed in MichAve-MH-9. Began traveling from MichAve-MH-9 to MichAve-MH-8A
12/16/2020	12:55	Encountered another manhole. Named it MichAve-MH-8B. Mike will make note on Young's report.
12/16/2020	13:10	Started traveling from MichAve-MH-8B to MichAve-MH-8A
12/16/2020	13:20	Ran into debris and could not continue.
12/16/2020	13:30	Encountered a large rock. Could not continue

Daily Log

12/16/2020	13:45	Began traveling from Verlinden-MH-5 to MichAve-MH-9
12/16/2020	13:55	Encountered same large rock and could not continue
12/16/2020	14:00	Began traveling from Verlinden-MH-5 to Verlinden-MH-4
12/16/2020	14:15	Encountered broken tile and had to remove rover
12/16/2020	14:25	Young's measured out distances between Michigan Ave manholes for their report
12/16/2020	14:50	Young's performed CCTV again from Verlinden-MH-4 to Verlinden-MH-5. They didn't realize they had passed to manhole the first inspection.
12/16/2020	15:00	Began traveling from Verlinden-MH-4 to Verlinden-MH-3. Stopped when encountering tile again
12/16/2020	15:10	Began traveling from Verlinden-MH-3 to Verlinden-MH-4
12/16/2020	15:20	Encountered broken tile and could not continue
12/16/2020	15:25	Began traveling from Verlinden-MH-3 to Verlinden-MH-8
12/16/2020	15:35	Encountered broken tile and could not continue.
12/16/2020	15:45	Young's burned their video and reports onto a flash drive
12/16/2020	16:10	Arcadis, young's and Spartan Barricade off site

Signature: 

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
12/16/2020										

Other Photos



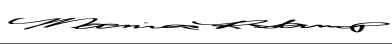
Concrete inside MichAve-MH-7



MichAve-MH-8

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations onsite during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing	Project Location: Lansing, MI
Project Number: 30042872	Date: 12/17/2020
	Time: 07:50
Conducted By: Marina Samp	Signature: 

Client and Sub-Contractore details

Client Name: RACER Trust	Client Contact: Dave Favero	Sub-Contractore Companies: Young's, Spartan Barricade

Tracking the Tailgate Meeting

Think through the Tasks(List the tasks for the day): CCTV Verlinden and Osborn

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations

Yes ☐

None ☒

Describe them here and how will they be controlled? _____

Pework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

Doc #

Doc #

☒ Not applicable	☐ Working at Height	☐ Confined Space
☐ Energy Isolation (LOTO)	☐ Excavation/Trenching	☐ Hot Work
☐ Mechanical Lifting Ops	☐ Overhead & Buried Utilities	☐ Other permit

Discuss following questions (for some review previous day's post activities). Check if yes:

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JLAS or procedures are available?	☐ Field teams to "dirty" JLAS, as needed?	☐ If deviations, notify PM & client
☐ Staff has appropriate PPE?	☐ Staff knows Emergency Plan (EAP)?	☐ All equipment checked & OK?
		☐ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Provide Description of Assessing the Risks:

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JLAS, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (See statements below)

☐ Elimination	☐ Substitution	☐ Isolation
☐ Engineering controls	☐ Administrative controls	☐ Monitoring

☐ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☐ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☐ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used (specify)	☐ TIP conducted (specify job/JSA)	☐ Traffic Control
		☐ Reviewed COVID Protocols

Summary of Discussion:

Signature and Certification Section - Site Staff and Visitors

Name	Company	Employee Task	Site Staff and Visitors Signature	Sign In Time	Sign Out Time	I have read and understand the HASP
Marina Samp	Arcadis	Oversight		07:50	13:30	yes
Mike Smith	Young's	CCTV		07:50	13:00	yes
Chris Thomas	Spartan Barricade	Traffic Control		07:50	12:30	yes
Joe Martin	Young's	CCTV		07:50	13:00	yes
Visitor Name/Co - not involved in work			In Time		Out Time	

Important Information and Numbers:

1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.
2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager.
3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.
4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Overall Comments:

Daily Log

Project Name : RACER Lansing

Weather(°F) : 26, cloudy

Project Number : 30042872

Prepared By: Marina Samp

Purpose : Sewer CCTV

PPE : Level D

Equipment:

Date	Time	Description of Activities
12/17/2020	07:50	Onsite, tailgate
12/17/2020	08:10	Mob to first manhole
12/17/2020	08:20	Verlinden- MH-8 and Verlinden-MH-7 do not exist, begin at Verlinden-MH-2 towards Verlinden-MH-3, make it 45 feet before fallen block from pipe prevented further CCTV
12/17/2020	09:00	CCTV from Verlinden-MH-2 towards Verlinden-MH-6, minimal distance CCTV'd due to sediment/debris buildup
12/17/2020	09:10	Locate Verlinden-MH-6, in intersection as opposed to sidewalk. Make minimal progress in both directions due to sediment and debris obstructions
12/17/2020	09:30	Locate Verlinden-MH-1, unable to CCTV towards Verlinden-MH-6 due to concrete in discharge pipe, mob to Outfall-013
12/17/2020	09:45	CCTV from Outfall-013 towards Osborn-MH-2, make it about 20' before obstruction in pipe prevents further CCTV
12/17/2020	10:00	Discover manhole in Osborn not on map, name Osborn-MH-3, CCTV from Osborn-MH-2 to catch basin along site, no pipe visible heading toward Outfall-013 in catch basin or Osborn-MH-2, CCTV toward Osborn-MH-3 until obstruction in pipe
12/17/2020	10:40	CCTV from Osborn-MH-3 to Osborn-MH-2, reach obstruction that blocked CCTV from other direction, pipe towards Osborn-MH-1 blocked by debris
12/17/2020	11:00	Osborn-MH-1 full of water and most pipes too small for rover. Break for lunch, will return to Michigan to inspect for pipes coming from site and CCTV
12/17/2020	11:50	Set up to view lateral coming from site at MichAve-MH-4 to ESC-2
12/17/2020	12:15	Set up at MichAve-MH-9 to view lateral
12/17/2020	12:35	Finish CCTV and cleanup, get flash drive with CCTV footage and reports
12/17/2020	13:00	Young's offsite, mob to Plant Biosparge to get O&M pictures
12/17/2020	13:30	Arcadis offsite

Signature:

Marina Samp

Waste Management:

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
12/17/2020	no					no				See tracker

RACER Lansing

Created	2021-03-01 09:04:28 EST by Anyssa Mandich
Updated	2021-03-01 11:48:04 EST by Anyssa Mandich
Location	,

General Information

Project	RACER Lansing
Date	2021-03-01
Time	09:00
Inspection Personnel	Anyssa Mandich

Plant 2

West Saginaw Parking Lot - East Side



Discharge noted in P2-MH-9?	No

Driving Path to Bridge to Plant 3



Plant 2 Drum Staging Area





Discharge noted in P2-MH-21?

No

Central Plant 2







Discharge noted in P2-MH-26 southern main?

No

Eastern Plant 2



Southern Plant 2





Discharge noted in P2-MH-W?

Yes

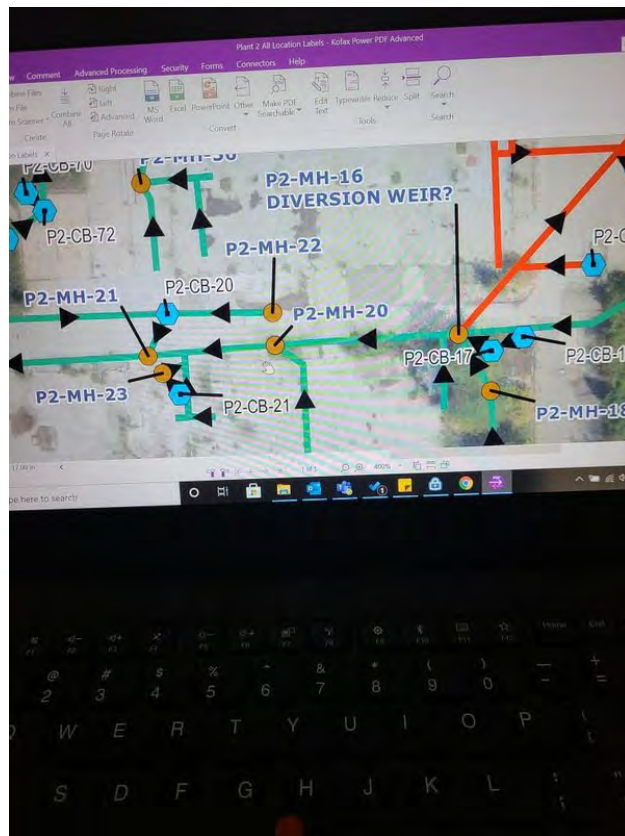
Other Photos



G transect



W of G transect



P2-MH-21 location



P2-MH-28

Comments	Low flow in P2-MH-W
Plant 3	
Discharge at P3-MH-NE	No
Willow Street Parking Lot Photos	





Discharge in southern invert of P3-MH-290?

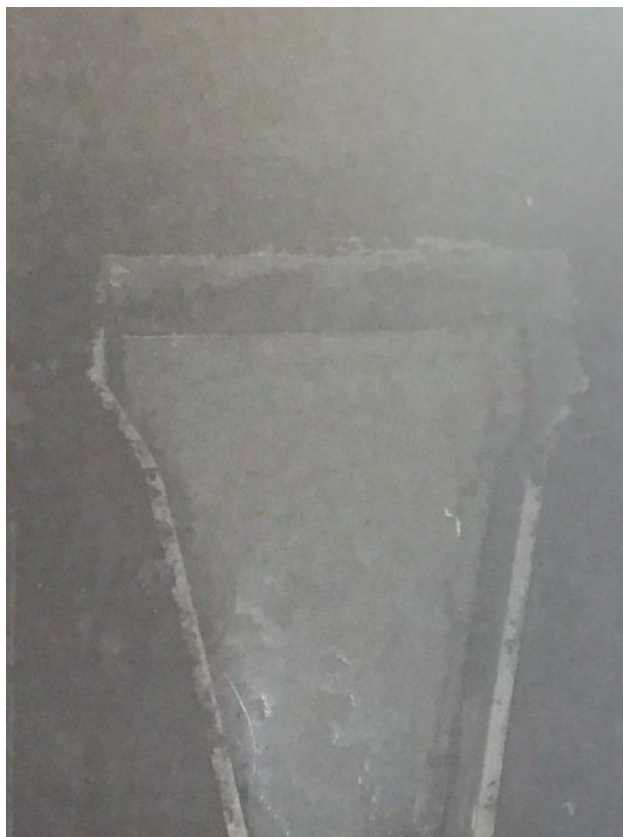
No



Discharge in Plant 3 Sanitary Vault?

No

Plant 3 Sanitary Vault



Eastern Plant 3











Plant 6

Northeast Corner





APPENDIX B

Construction Photo Log



PHOTOGRAPH LOG

Plants 2, 3 & 6 Storm Sewer Modifications Completion Report



Photograph 1: Typical cleaned manhole to be filled with concrete



Photograph 2: Typical capped catch basin



Photograph 3: Typical manhole filled with concrete to ground surface



Photograph 4: Lid placed on rectangular catch basin that was missing its lid



Photograph 5: Lid placed on circular catch basin that was missing its lid



Photograph 6: Typical plugged pipe in Osborn-MH-1

PHOTOGRAPH LOG

Plants 2, 3 & 6 Storm Sewer Modifications Completion Report



Photograph 7: Beginning of building bulkhead form in Plant 3 Sanitary Vault



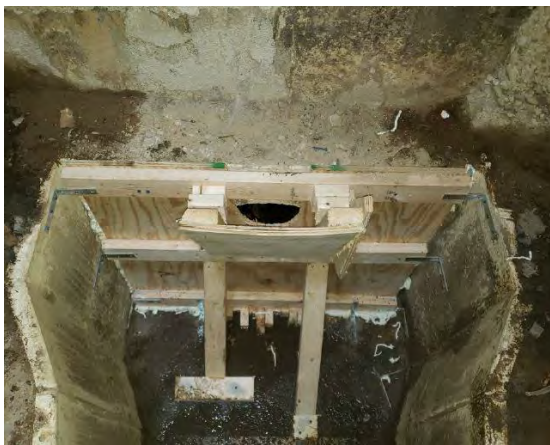
Photograph 8: Continued building of bulkhead form



Photograph 9: Continued building of bulkhead form, using bonding agent



Photograph 10: Continued building of bulkhead form, using more rebar



Photograph 11: Bulkhead form, view from above



Photograph 12: Bulkhead form, view from inside vault

PHOTOGRAPH LOG

Plants 2, 3 & 6 Storm Sewer Modifications Completion Report



Photograph 13: Completed bulkhead after concrete pour



Photograph 14: Fallen piece of pipe blocking CCTV path



Photograph 15: Active pipe coming from Plant 6 along Verlinden



Photograph 16: Blocked pipe called "cut and cap" in 2014 documents located upstream of plant boundary



Photograph 17: Zoomed in view of "cut and cap" upstream of property boundary



Photograph 18: Inspection of ESC-2 fill from downstream indicated impartial fill and infiltration

PHOTOGRAPH LOG

Plants 2, 3 & 6 Storm Sewer Modifications Completion Report



Photograph 19: Plant 2 northeast corner runoff inspection



Photograph 20: Plant 2 bridge to Plant 3 runoff inspection



Photograph 21: Plant 2 drum staging area (northeastern boundary within fence) runoff inspection



Photograph 22: Plant 2 eastern boundary runoff inspection



Photograph 23: Plant 2 north of southern retaining wall runoff inspection



Photograph 24: Plant 3 Willow Street parking lot runoff inspection

PHOTOGRAPH LOG

Plants 2, 3 & 6 Storm Sewer Modifications Completion Report



Photograph 25: Plant 3 eastern boundary runoff inspection



Photograph 26: Plant 3 southwestern boundary within the fence runoff inspection



Photograph 27: Plant 3 western boundary runoff inspection



Photograph 28: Plant 3 southern parking lot runoff inspection



Photograph 29: Plant 6 Osborn entrance runoff inspection



Photograph 30: Plant 6 intersection with Osborn and Stanley runoff inspection

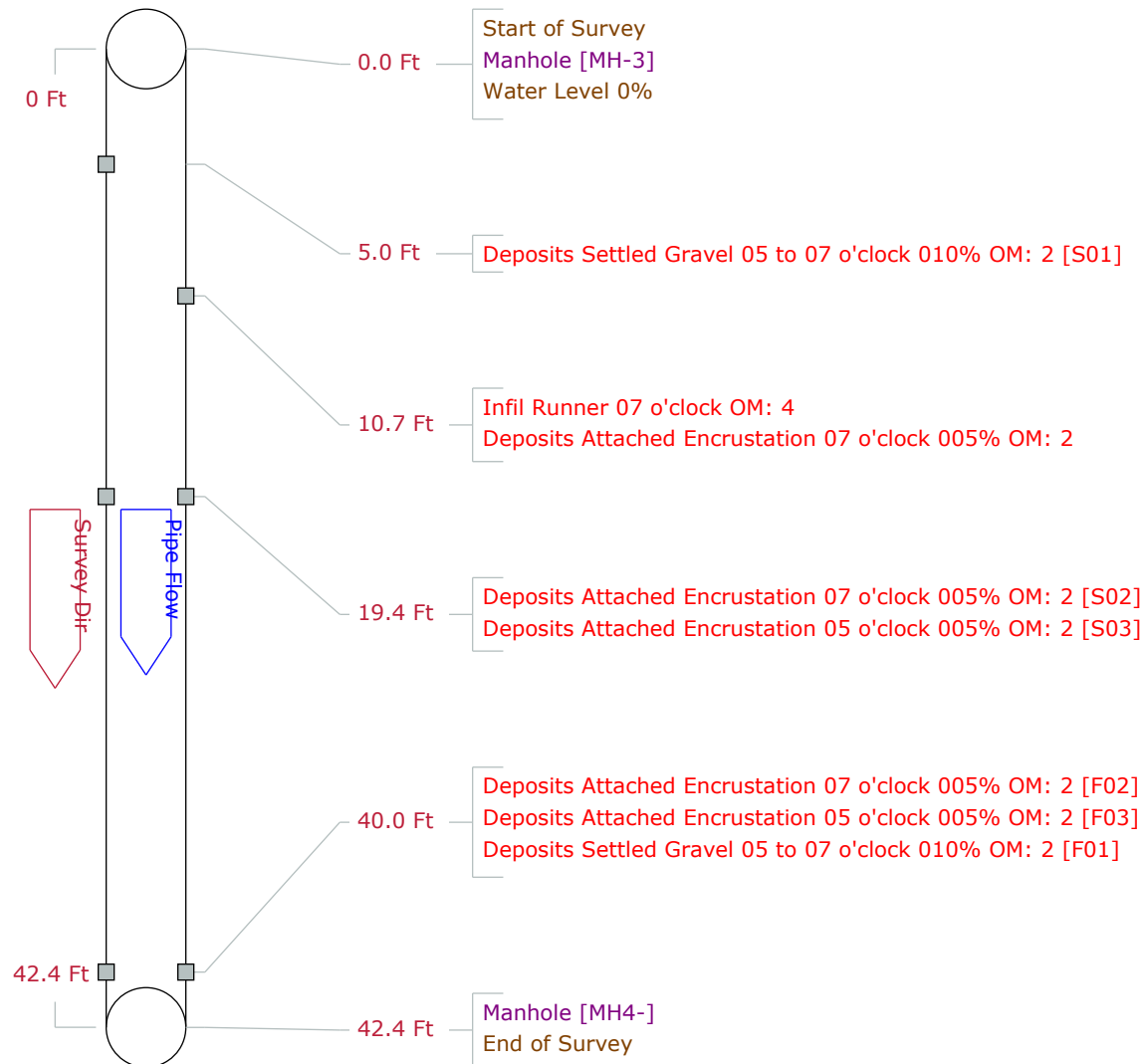
APPENDIX C

CCTV Inspection Report



Pipe Graphic Report of PSR MH-3 X for ARCADIS

Setup	2	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 8:26		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH-3		Rim to invert		Grade to invert	
Down	MH-5		Rim to invert		Grade to invert	
Use	Stormwater		Direction Downstream		Flow control	
Shape	Circular		Height 48		Media No	
			Width ins		Preclean N	
Material	Reinforced Concrete Pipe		Joint length Ft		Date Cleaned	
			Total length 42.4 Ft		Length Surveyed 42.40 Ft	
Lining			Year laid		Weather	
Purpose			Cat			
Additional info					Structural	
Location	Light Highway				O & M	
Project	WWTP				Miscellaneous	
Northing					Hydraulic	
Coordinate System					Constructional	
					Work Order	
	Easting				Elevation	
					GPS Accuracy	



Tabular Report of PSR MH-3 X for ARCADIS

Setup 2	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 8:26	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-3	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-5	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 42.4 Ft	Length Surveyed 42.4 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-3
0.0			MWL Water Level			0				
5.0		S01	DSGV Deposits Settled Gravel			10	05	07		
10.7			IR Infil Runner				J	07		
10.7			DAE Deposits Attached Encrustation			5	J	07		
19.4		S02	DAE Deposits Attached Encrustation			5	J	07		
19.4		S03	DAE Deposits Attached Encrustation			5	J	05		
40.0		F02	DAE Deposits Attached Encrustation			5	J	07		
40.0		F03	DAE Deposits Attached Encrustation			5	J	05		
40.0		F01	DSGV Deposits Settled Gravel			10	05	07		
42.4			AMH Manhole							MH4-
42.4			FH End of Survey							

42.4 Ft Total Length Surveyed

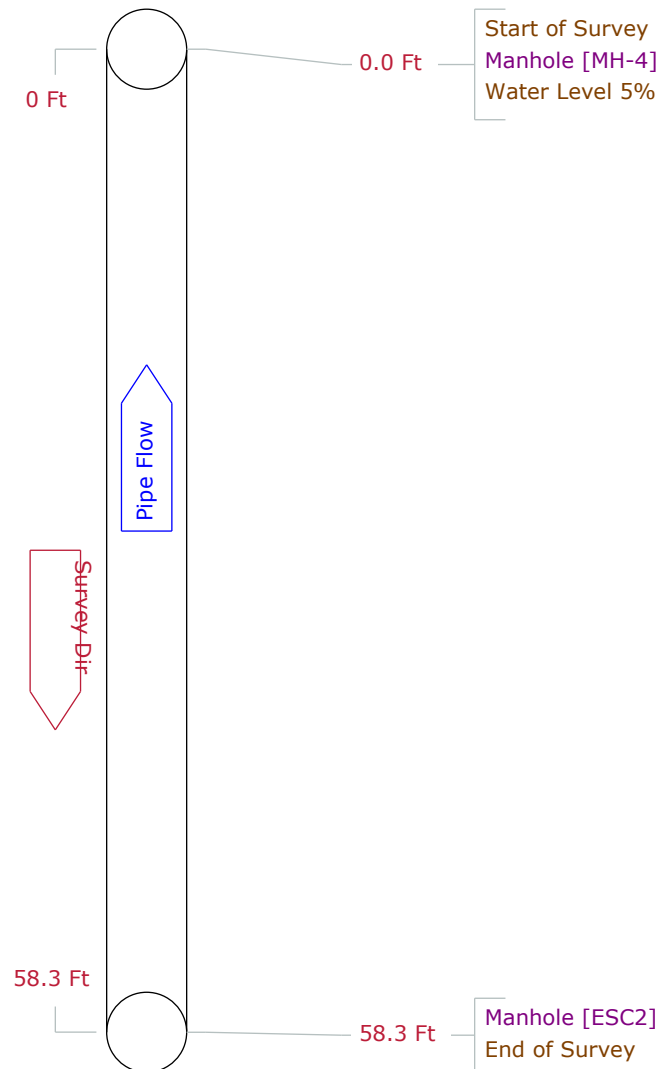
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 36	Pipe Ratings Index 2.1	Quick Rating 412B
	Overall	Pipe Rating 36	Pipe Ratings Index 2.1	Quick Rating 412B



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Pipe Graphic Report of PSR ESC2 X for ARCADIS

Setup	30	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/17		Time 11:57		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	ESC2		Rim to invert		Grade to invert	
Down	MH-4		Rim to invert		Grade to invert	
Use			Direction Upstream		Flow control	
Shape	Circular		Height 36		Media No	
			Width		ins	
Material	Reinforced Concrete Pipe		Joint length		Ft	
			Total length 58.3		Ft	
Lining			Year laid		Weather Snow	
Purpose			Year rehabilitated		Cat	
Additional info					Structural	
Location	Light Highway				O & M	
Project	WWTP				Constructional	
Northing	Easting				Work Order	
Coordinate System					Elevation	
					GPS Accuracy	



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Tabular Report of PSR ESC2 X for ARCADIS

Setup 30	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 11:57	Street W MICHIGAN AVE
City LANSING	Further location details		
Up ESC2	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-4	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Up	Flow control	Media No
Shape Circular	Height 36 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 58.3 Ft	Length Surveyed 58.3 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-4
0.0			MWL Water Level			5				
58.3			AMH Manhole							ESC2
58.3			FH End of Survey							

58.3 Ft Total Length Surveyed

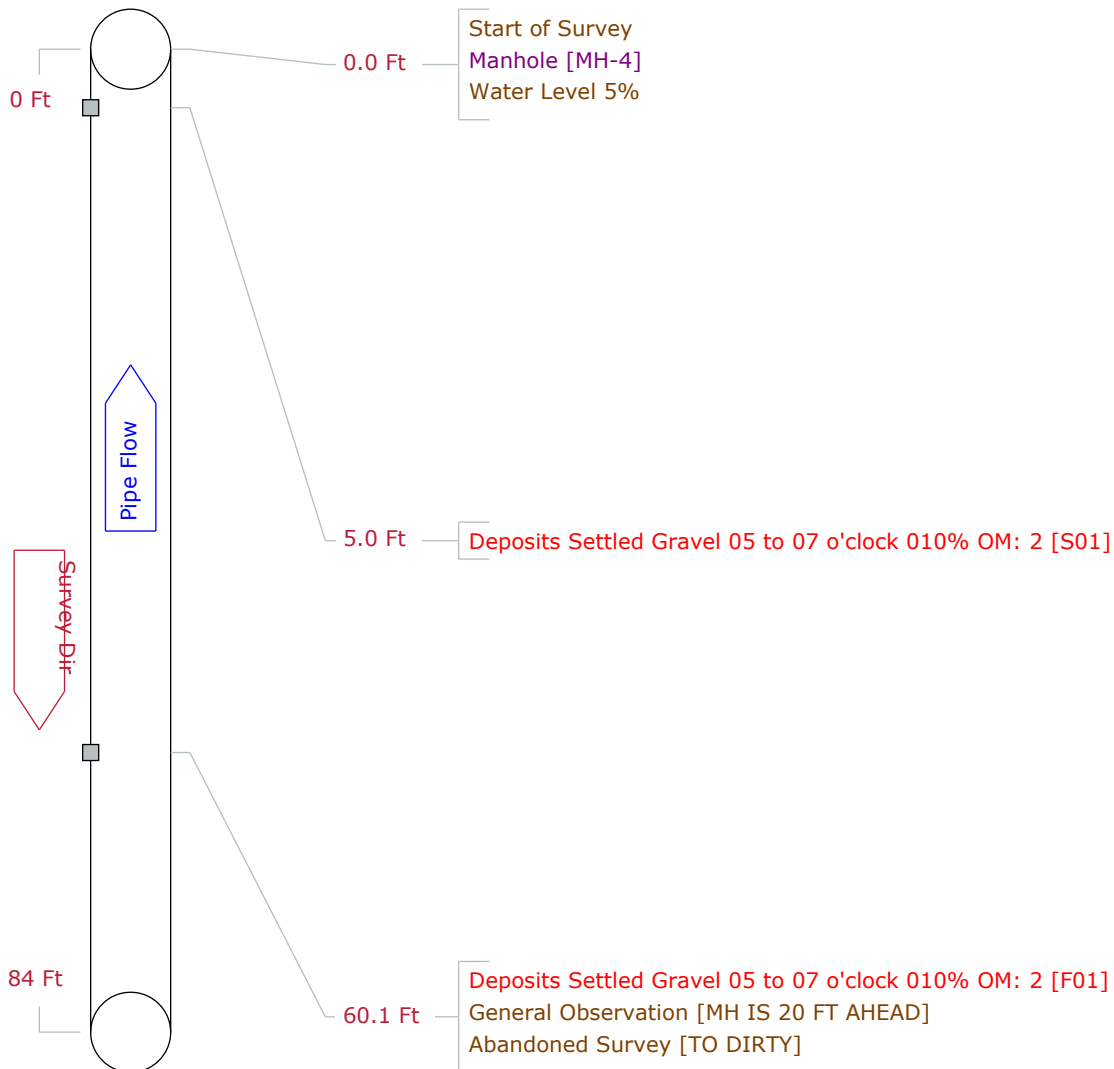
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR MH-7 X for ARCADIS

Setup	8/7	Surveyor	MS	Certificate #	U-511-12462	System Owner	
Drainage				Survey Customer			
P/O #		Date	2020/12/16	Time	10:28	Street	W MICHIGAN AVE
City	LANSING			Further location details			
Up	MH-7			Rim to invert		Grade to invert	Rim to grade Ft
Down	MH-4			Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater			Direction	Upstream	Flow control	Media No
Shape	Circular			Height	48	Width	ins Preclean N
Material	Reinforced Concrete Pipe			Joint length	Ft	Total length	84.0 Ft
Lining				Year laid		Year rehabilitated	Length Surveyed 60.10 Ft
Purpose				Cat			Weather
Additional info	Reverse set up on sheet:7					Structural	O & M
Location	Light Highway					Miscellaneous	Hydraulic
Project	WWTP					Constructional	
Northing	Easting					Work Order	
Coordinate System						Elevation	
						GPS Accuracy	



Tabular Report of PSR MH-7 X for ARCADIS

Setup 8	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 10:28	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-7	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-4	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Reinforced Concrete Pipe	Joint length	Ft	Total length 84.0 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:7		Structural O & M Constructional
Location	Light Highway		Miscellaneous
Project	WWTP		Work Order
Northing	Easting		Elevation
Coordinate System	GPS Accuracy		

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-4
0.0			MWL Water Level			5				
5.0		S01	DSGV Deposits Settled Gravel			10	05	07		
60.1		F01	DSGV Deposits Settled Gravel			10	05	07		
60.1			MGO General Observation							MH IS 20 FT AHEAD
60.1			MSA Abandoned Survey							TO DIRTY

60.1 Ft Total Length Surveyed

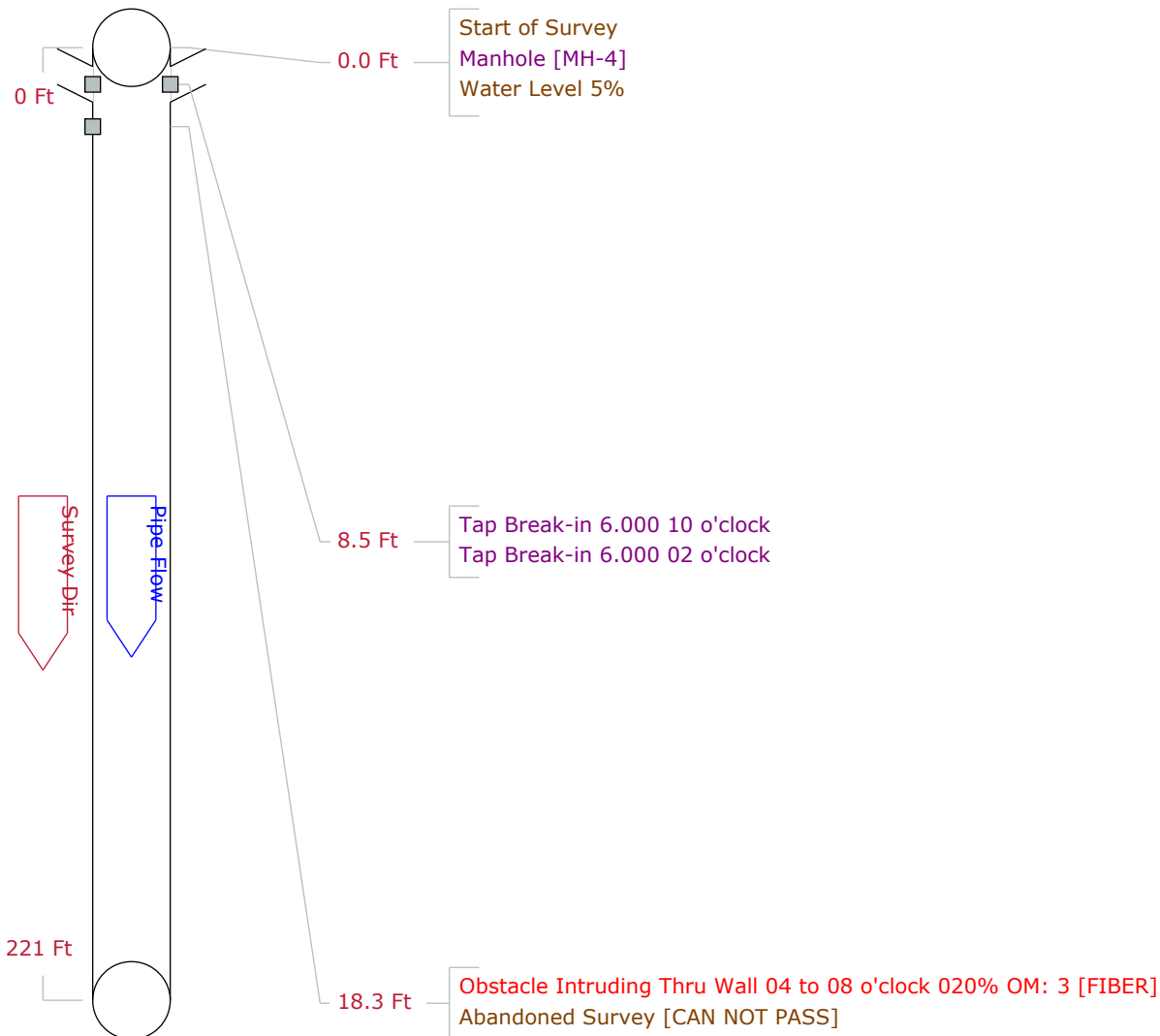
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 22	Pipe Ratings Index 2	Quick Rating 2A00
	Overall	Pipe Rating 22	Pipe Ratings Index 2	Quick Rating 2A00



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Pipe Graphic Report of PSR MH-4 X for ARCADIS

Setup	9	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 10:36		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH-4		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH-8		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Downstream	Flow control	Media No
Shape	Circular		Height	48	Width ins	Preclean N Date Cleaned
Material	Segmented Block		Joint length Ft		Total length	221.0 Ft Length Surveyed 18.30 Ft
Lining			Year laid		Year rehabilitated	Weather Dry
Purpose			Cat			
Additional info					Structural	O & M
Location					Miscellaneous	Hydraulic
Project					WWTP Work Order	
Northing					Easting	
Coordinate System					Elevation	
					GPS Accuracy	



Tabular Report of PSR MH-4 X for ARCADIS

Setup 9	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 10:36	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-4	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-8	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 221.0 Ft
Lining	Year laid	Year rehabilitated	Weather Dry
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-4
0.0			MWL Water Level			5				
8.5			TB Tap Break-in	6.000			10			
8.5			TB Tap Break-in	6.000			02			
18.3			OBI Obstacle Intruding Thru Wall			20	04	08		FIBER
18.3			MSA Abandoned Survey							CAN NOT PASS

18.3 Ft Total Length Surveyed

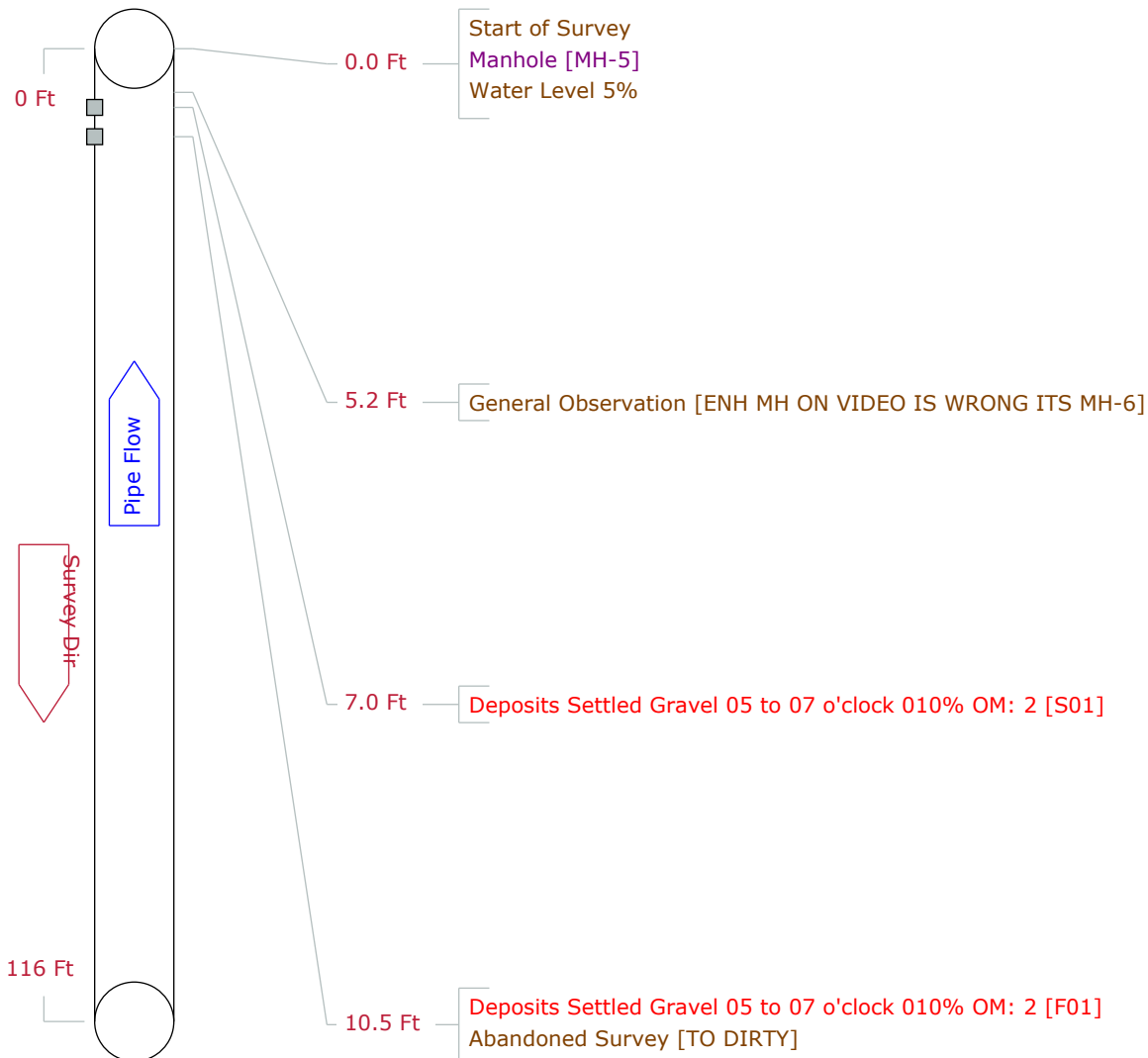
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 3	Pipe Ratings Index 3	Quick Rating 3100
	Overall	Pipe Rating 3	Pipe Ratings Index 3	Quick Rating 3100



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Pipe Graphic Report of PSR MH4- X for ARCADIS

Setup	4/3	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 9:08		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH-6		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH-5		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Upstream	Flow control	Media No
Shape	Circular		Height	48 ins	Width	Preclean N Date Cleaned
Material	Reinforced Concrete Pipe		Joint length	Ft	Total length	116.0 Ft Length Surveyed 10.50 Ft
Lining			Year laid	Year rehabilitated		Weather
Purpose			Cat			
Additional info	Reverse set up on sheet:3				Structural	O & M
Location	Light Highway				Miscellaneous	Hydraulic
Project	WWTP				Work Order	
Northing	Easting				Elevation	
Coordinate System					GPS Accuracy	



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Tabular Report of PSR MH4- X for ARCADIS

Setup 4	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 9:08	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-6	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-5	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Reinforced Concrete Pipe	Joint length	Ft	Total length 116.0 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info Reverse set up on sheet:3		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-5
0.0			MWL Water Level			5				
5.2			MGO General Observation							ENH MH ON VIDEO IS WRONG ITS
7.0		S01	DSGV Deposits Settled Gravel			10	05	07		
10.5		F01	DSGV Deposits Settled Gravel			10	05	07		
10.5			MSA Abandoned Survey							TO DIRTY

10.5 Ft Total Length Surveyed

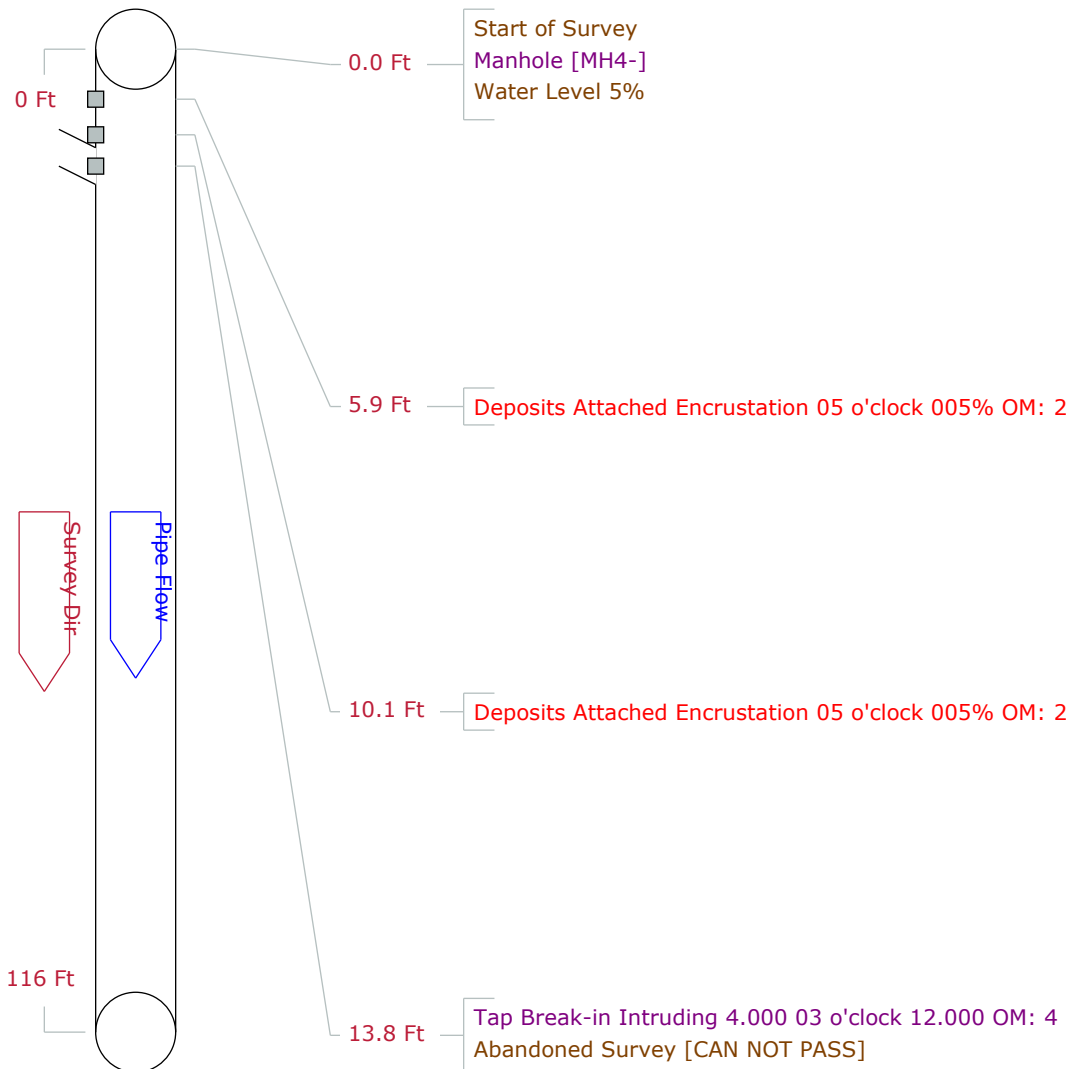
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH4- X for ARCADIS

Setup	3/4	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 8:51		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH-6		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH-5		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Downstream	Flow control	Media No
Shape	Circular		Height	48 ins	Width	Preclean N Date Cleaned
Material	Reinforced Concrete Pipe		Joint length		Ft	Total length 116.0 Ft Length Surveyed 13.80 Ft
Lining			Year laid		Year rehabilitated	Weather
Purpose			Cat			
Additional info					Structural	O & M
Location	Light Highway		Miscellaneous			
Project	WWTP		Work Order			
Northing			Easting		Elevation	
Coordinate System			GPS Accuracy			



Tabular Report of PSR MH4- X for ARCADIS

Setup 3	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 8:51	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-6	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-5	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Reinforced Concrete Pipe	Joint length	Ft Total length 116.0 Ft	Date Cleaned
Lining	Year laid	Year rehabilitated	Length Surveyed 13.8 Ft
Purpose	Cat		Weather
Additional info			Pressure
Location Light Highway			Structural O & M Constructional Miscellaneous
Project WWTP			Work Order
Northing	Easting		Elevation
Coordinate System			GPS Accuracy

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH4-
0.0			MWL Water Level			5				
5.9			DAE Deposits Attached Encrustation			5	J	05		
10.1			DAE Deposits Attached Encrustation			5	J	05		
13.8			TBI Tap Break-in Intruding	4.000	12.000			03		
13.8			MSA Abandoned Survey							CAN NOT PASS

13.8 Ft Total Length Surveyed

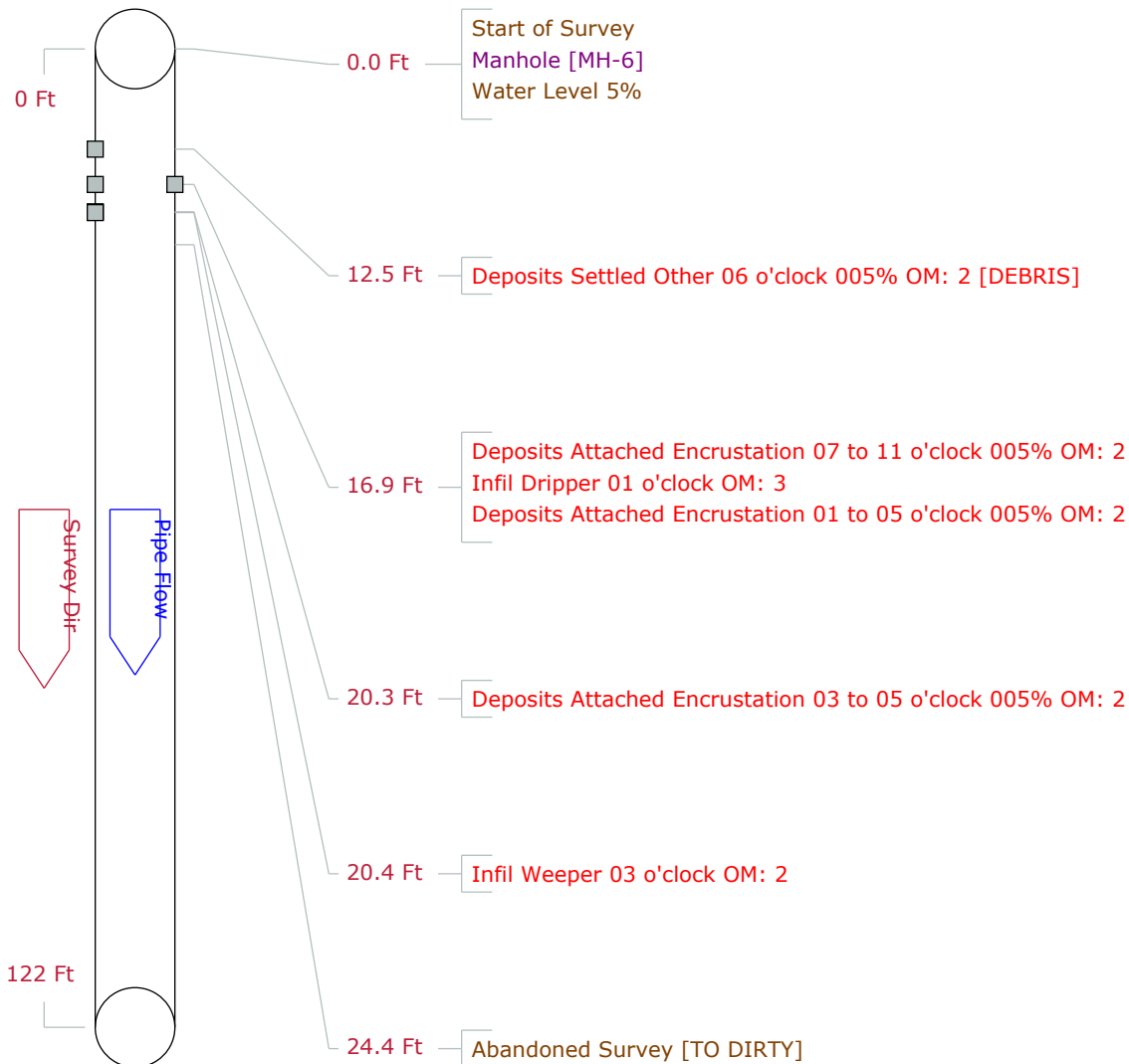
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 8	Pipe Ratings Index 2.7	Quick Rating 4122
	Overall	Pipe Rating 8	Pipe Ratings Index 2.7	Quick Rating 4122



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Pipe Graphic Report of PSR MH-6 X for ARCADIS

Setup	5/6	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 9:34		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH-6		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH-7		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Downstream	Flow control	Media No
Shape	Circular		Height	48 ins	Width	Preclean N Date Cleaned
Material	Reinforced Concrete Pipe		Joint length Ft		Total length	122.0 Ft Length Surveyed 24.40 Ft
Lining			Year laid		Year rehabilitated	Weather
Purpose			Cat			
Additional info					Structural	O & M
Location	Light Highway				Miscellaneous	Constructional
Project	WWTP				Work Order	
Northing	Easting				Elevation	
Coordinate System				GPS Accuracy		



Tabular Report of PSR MH-6 X for ARCADIS

Setup 5	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 9:34	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-6	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-7	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 122.0 Ft	Length Surveyed 24.4 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-6
0.0			MWL Water Level			5				
12.5			DSZ Deposits Settled Other			5	06			DEBRIS
16.9			DAE Deposits Attached Encrustation			5	07	11		
16.9			ID Infil Dripper				01			
16.9			DAE Deposits Attached Encrustation			5	01	05		
20.3			DAE Deposits Attached Encrustation			5	J 03	05		
20.4			IW Infil Weeper				J 03			
24.4			MSA Abandoned Survey							TO DIRTY

24.4 Ft Total Length Surveyed

Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 13	Pipe Ratings Index 2.2	Quick Rating 3125
	Overall	Pipe Rating 13	Pipe Ratings Index 2.2	Quick Rating 3125



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Tabular Report of PSR MH-7 X for ARCADIS

Setup 7	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 10:03	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-7	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-4	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 84.0 Ft	Length Surveyed 0.0 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-7
0.0			MWL Water Level			5				
0.0			MSA Abandoned Survey							TO DIRTY

0.0 Ft Total Length Surveyed

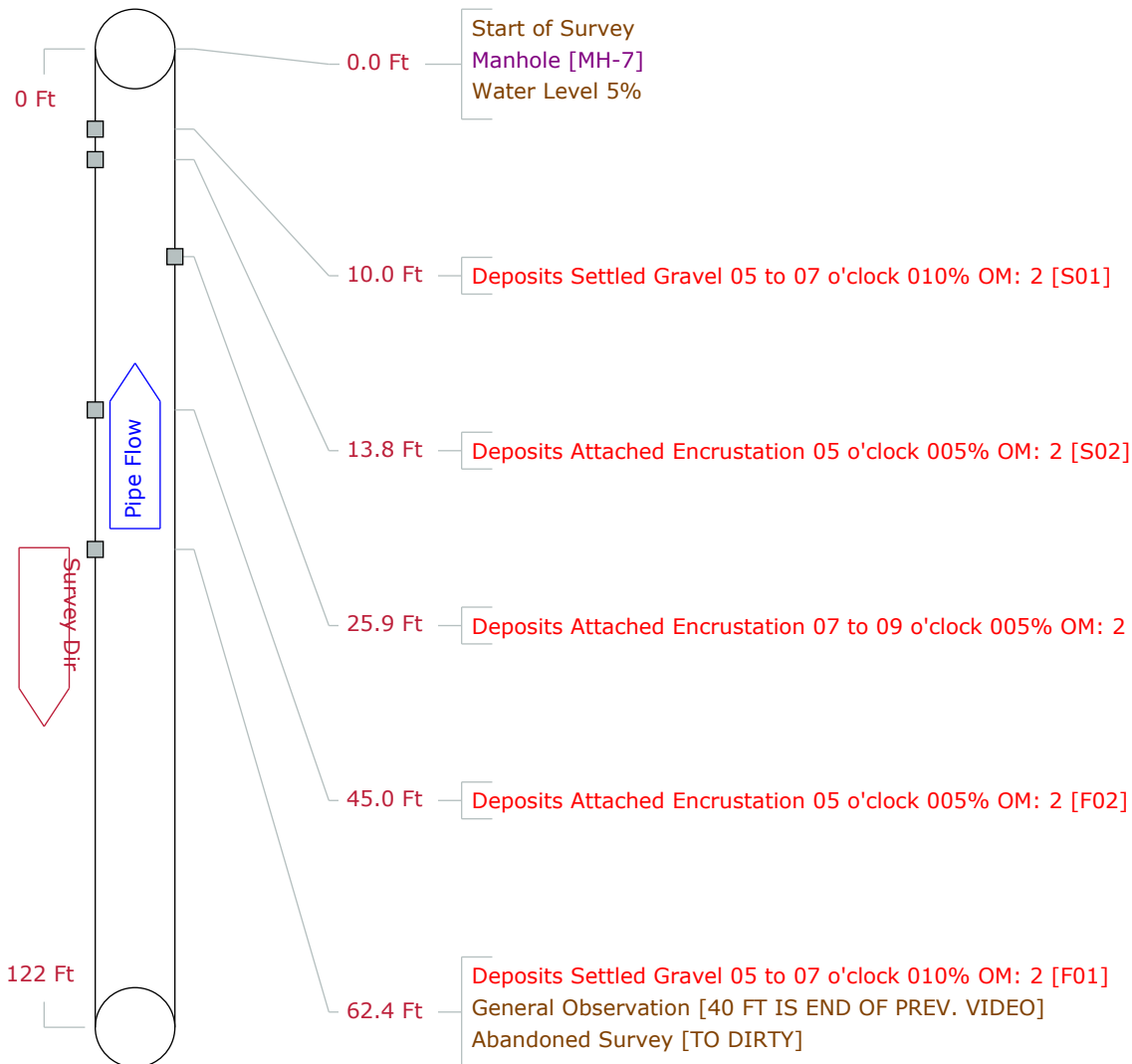
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR MH-6 X for ARCADIS

Setup	6/5	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 9:53		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH-6		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH-7		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Upstream	Flow control	Media No
Shape	Circular		Height	48	Width ins	Preclean N Date Cleaned
Material	Reinforced Concrete Pipe		Joint length	Ft	Total length	122.0 Ft Length Surveyed 62.40 Ft
Lining			Year laid	Year rehabilitated		Weather
Purpose			Cat			
Additional info	Reverse set up on sheet:5				Structural	O & M
Location	Light Highway				Miscellaneous	Hydraulic
Project	WWTP				Work Order	
Northing	Easting				Elevation	
Coordinate System					GPS Accuracy	



Tabular Report of PSR MH-6 X for ARCADIS

Setup 6	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 9:53	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-6	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-7	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 48 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 122.0 Ft	Length Surveyed 62.4 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:5	Structural	O & M
Location Light Highway		Miscellaneous	Constructional
Project WWTP		Work Order	
Northing	Easting	Elevation	
Coordinate System		GPS Accuracy	

Count Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST Start of Survey							
0.0		AMH Manhole							MH-7
0.0		MWL Water Level			5				
10.0	S01	DSGV Deposits Settled Gravel			10	05	07		
13.8	S02	DAE Deposits Attached Encrustation			5	J	05		
25.9		DAE Deposits Attached Encrustation			5	J	07	09	
45.0	F02	DAE Deposits Attached Encrustation			5	J	05		
62.4	F01	DSGV Deposits Settled Gravel			10	05	07		
62.4		MGO General Observation							40 FT IS END OF PREV. VIDEO
62.4		MSA Abandoned Survey							TO DIRTY

62.4 Ft Total Length Surveyed

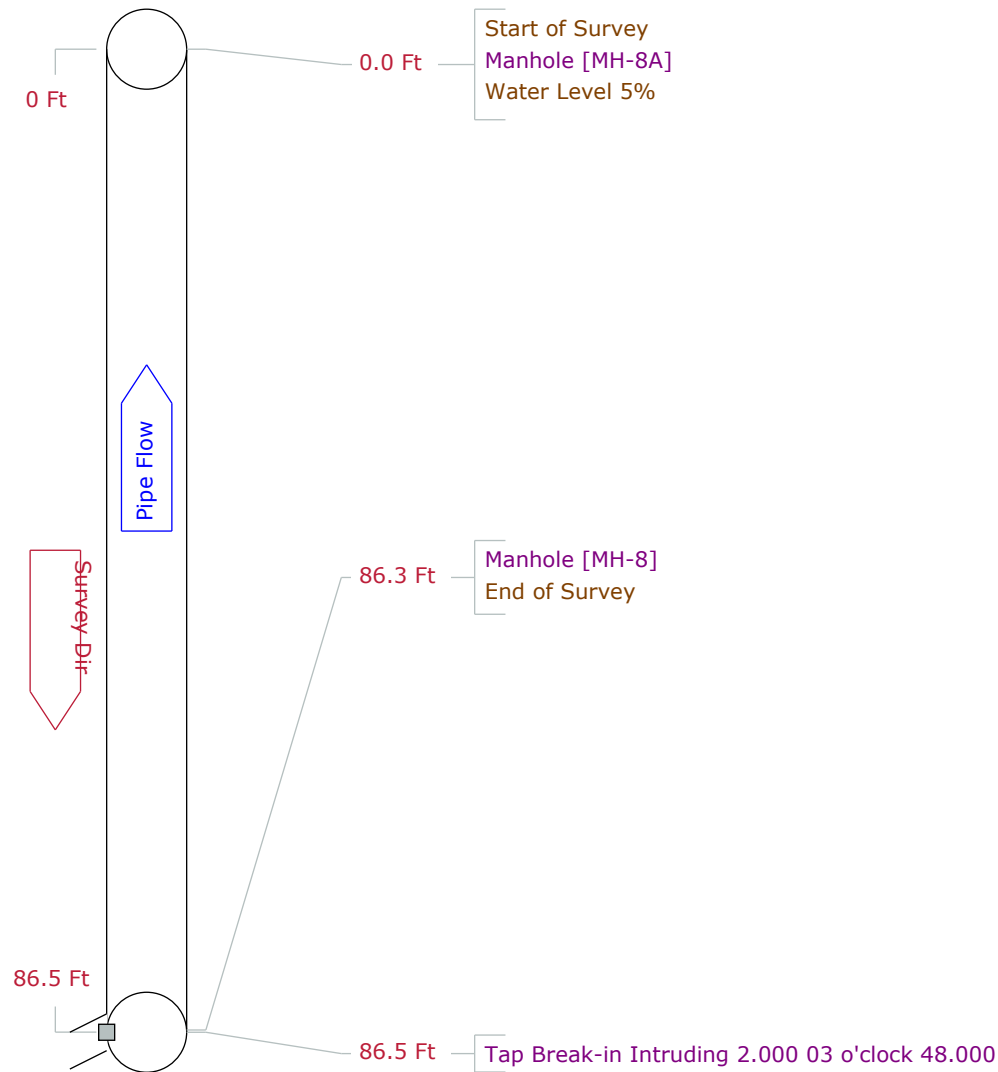
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 34	Pipe Ratings Index 2	Quick Rating 2B00
	Overall	Pipe Rating 34	Pipe Ratings Index 2	Quick Rating 2B00



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Pipe Graphic Report of PSR MH-8 X for ARCADIS

Setup	10	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 11:00		Street W MICHIGAN AVE	
City	LANSING	Further location details				
Up	MH-8	Rim to invert		Grade to invert		Rim to grade Ft
Down	MH-8A	Rim to invert		Grade to invert		Rim to grade Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No
Shape	Egg Shaped	Height	48	Width	48 ins	Preclean N
Material	Segmented Block	Joint length		Ft	Total length	86.3 Ft
Lining		Year laid		Year rehabilitated		Weather Dry
Purpose		Cat				
Additional info				Structural		
Location	Light Highway			O & M		
Project	WWTP			Constructional		
Northing		Easting		Work Order		
Coordinate System				Elevation		
				GPS Accuracy		



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Tabular Report of PSR MH-8 X for ARCADIS

Setup 10	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 11:00	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-8	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-8A	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Egg Shaped	Height 48	Width 48 ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 86.3 Ft
Lining	Year laid	Year rehabilitated	Weather Dry
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-8A
0.0			MWL Water Level			5				
86.3			AMH Manhole							MH-8
86.3			FH End of Survey							
86.5			TBI Tap Break-in Intruding	2.000	48.000		03			

86.5 Ft Total Length Surveyed

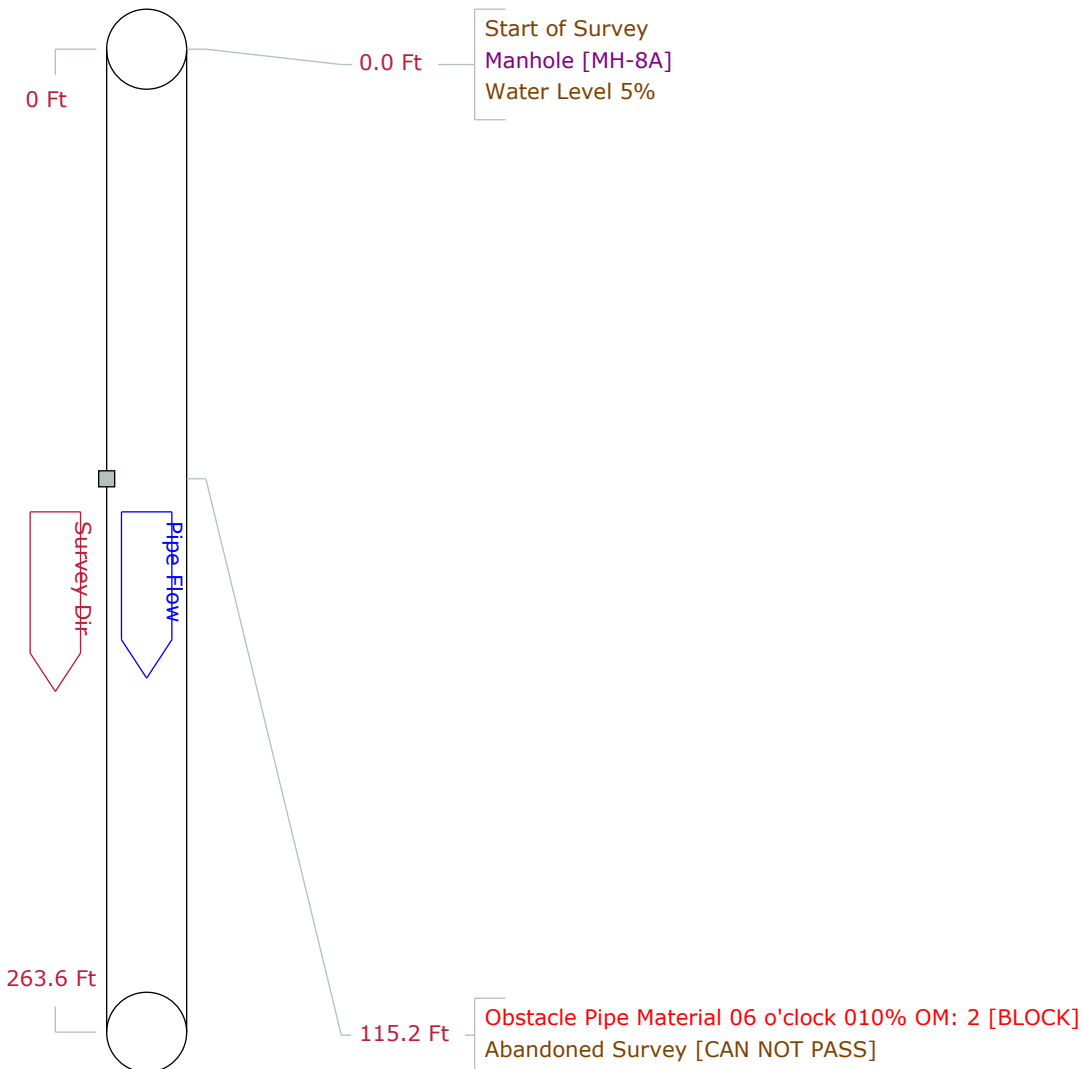
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR MH-8A X for ARCADIS

Setup	11/12	Surveyor	MS	Certificate #	U-511-12462	System Owner				
Drainage	Survey Customer									
P/O #	Date		2020/12/16	Time	11:08	Street	W MICHIGAN AVE			
City	LANSING		Further location details							
Up	MH-8A		Rim to invert		Grade to invert		Rim to grade	Ft		
Down	MH-9		Rim to invert		Grade to invert		Rim to grade	Ft		
Use	Stormwater		Direction	Downstream	Flow control		Media No			
Shape	Circular		Height	48	Width	48	ins	Preclean N	Date Cleaned	
Material	Segmented Block		Joint length		Ft	Total length		263.6 Ft	Length Surveyed	115.20 Ft
Lining			Year laid		Year rehabilitated		Weather Dry			
Purpose					Cat					
Additional info						Structural		O & M	Constructional	
Location	Light Highway					Miscellaneous		Hydraulic		
Project	WWTP					Work Order				
Northing					Easting		Elevation			
Coordinate System						GPS Accuracy				



Tabular Report of PSR MH-8A X for ARCADIS

Setup 11	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 11:08	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-8A	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-9	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48 Width 48 ins	Preclean N	Date Cleaned
Material Segmented Block	Joint length Ft	Total length 263.6 Ft	Length Surveyed 115.2 Ft
Lining	Year laid	Year rehabilitated	Weather Dry
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-8A
0.0			MWL Water Level			5				
115.2			OBM Obstacle Pipe Material			10	06			BLOCK
115.2			MSA Abandoned Survey							CAN NOT PASS

115.2 Ft Total Length Surveyed

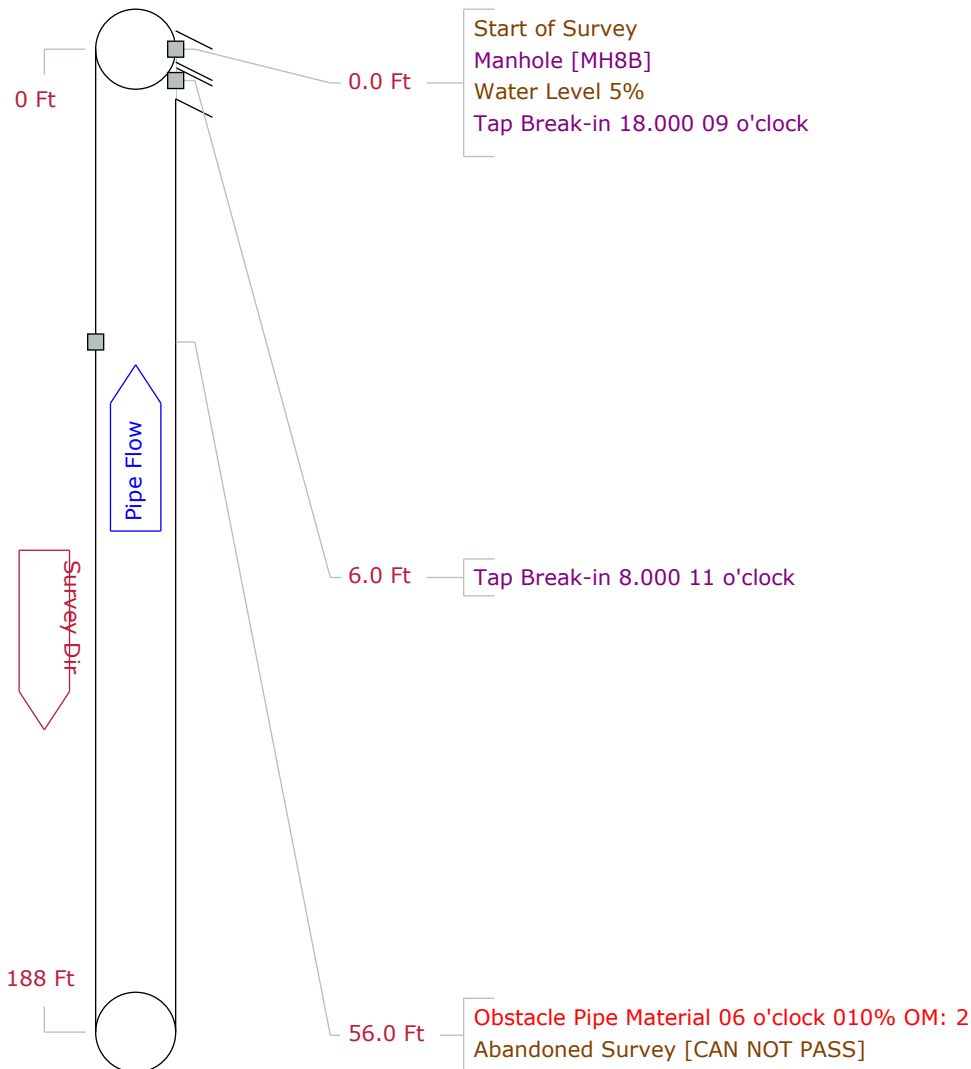
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH8A X for ARCADIS

Setup	13	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 13:05		Street W MICHIGAN AVE	
City	LANSING		Further location details			
Up	MH8A		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH8B		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Upstream	Flow control	Media No
Shape	Circular		Height	48	Width ins	Preclean N Date Cleaned
Material	Segmented Block		Joint length Ft		Total length 188.0 Ft	Length Surveyed 56.00 Ft
Lining			Year laid		Year rehabilitated	Weather Snow
Purpose			Cat			
Additional info					Structural	O & M
Location	Light Highway				Miscellaneous	Hydraulic
Project	WWTP				Work Order	
Northing	Easting				Elevation	
Coordinate System					GPS Accuracy	



Tabular Report of PSR MH8A X for ARCADIS

Setup 13	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 13:05	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH8A	Rim to invert	Grade to invert	Rim to grade Ft
Down MH8B	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 188.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH8B
0.0			MWL Water Level			5				
0.0			TB Tap Break-in	18.000			09			
6.0			TB Tap Break-in	8.000			11			
56.0			OBM Obstacle Pipe Material			10	06			
56.0			MSA Abandoned Survey							CAN NOT PASS

56.0 Ft Total Length Surveyed

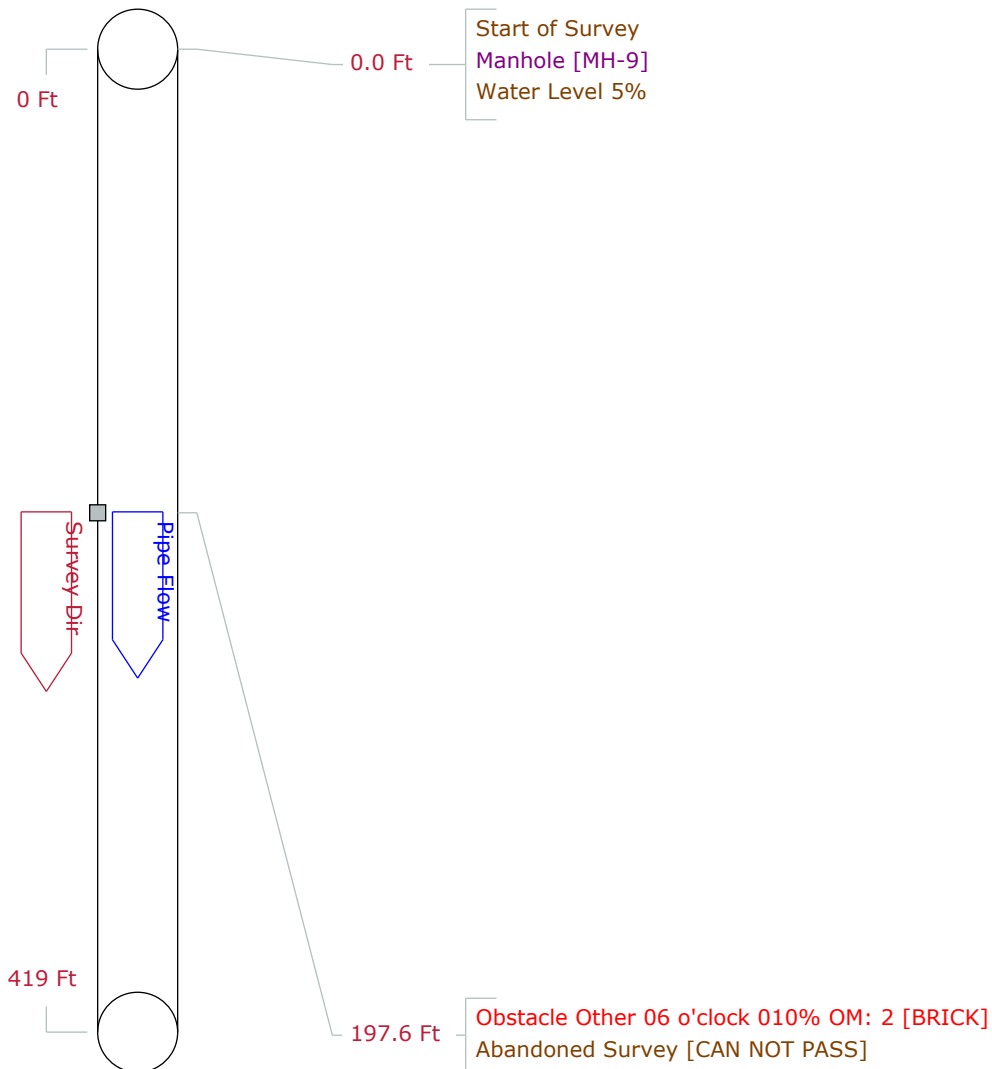
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH-9 X for ARCADIS

Setup	14/15 Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer				
P/O #	Date	2020/12/16	Time	13:15	Street W MICHIGAN AVE
City	LANSING	Further location details			
Up	MH-9	Rim to invert	Grade to invert	Rim to grade	Ft
Down	MH-05	Rim to invert	Grade to invert	Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control	Media No
Shape	Circular	Height	48	Width	ins
Material	Segmented Block	Joint length	Ft	Total length	419.0 Ft
Lining		Year laid		Year rehabilitated	
Purpose		Cat		Weather	Snow
Additional info				Structural	O & M
Location	Light Highway			Miscellaneous	Hydraulic
Project	WWTP	Work Order			
Northing		Easting		Elevation	
Coordinate System				GPS Accuracy	



Tabular Report of PSR MH-9 X for ARCADIS

Setup 14	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 13:15	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-9	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-05	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 419.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-9
0.0			MWL Water Level			5				
197.6			OBZ Obstacle Other			10	06			BRICK
197.6			MSA Abandoned Survey							CAN NOT PASS

197.6 Ft Total Length Surveyed

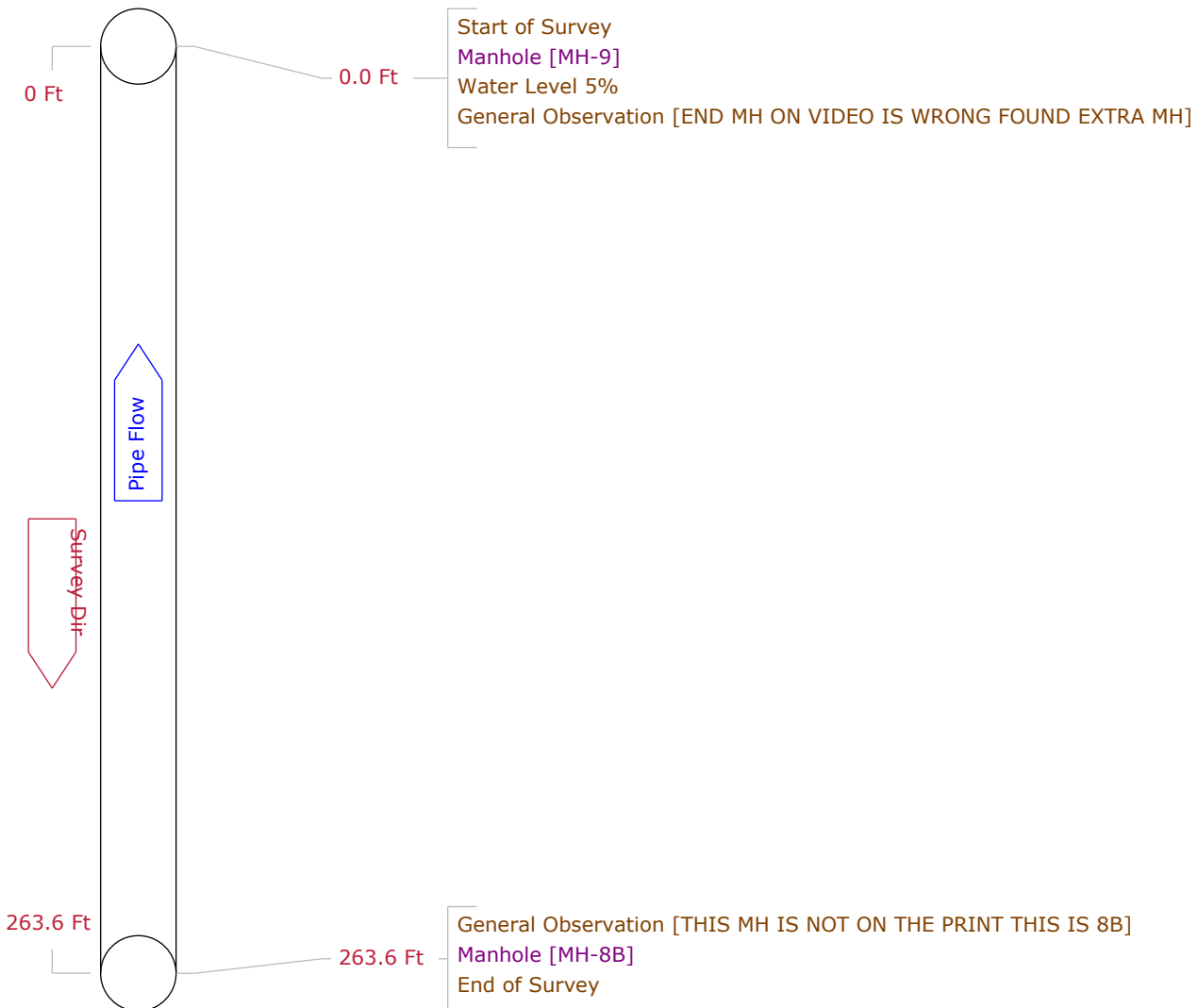
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH-8A X for ARCADIS

Setup	12/11	Surveyor	MS	Certificate #	U-511-12462	System Owner		
Drainage	Survey Customer							
P/O #	Date		2020/12/16	Time	12:42	Street	W MICHIGAN AVE	
City	LANSING		Further location details					
Up	MH-8A		Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH-9		Rim to invert		Grade to invert		Rim to grade	Ft
Use	Stormwater		Direction	Upstream		Flow control		Media No
Shape	Circular		Height	48	Width	48	ins	Preclean N
Material	Segmented Block		Joint length		Ft	Total length		263.6 Ft
Lining			Year laid		Year rehabilitated		Length Surveyed 263.60 Ft	
Purpose					Weather		Dry	
							Cat	
Additional info							Structural	O & M
Location							Light Highway	Constructional
							Miscellaneous	Hydraulic
Project	WWTP		Work Order					
Northing			Easting		Elevation			
Coordinate System			GPS Accuracy					



Tabular Report of PSR MH-8A X for ARCADIS

Setup 12	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 12:42	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-8A	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-9	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 48 Width 48 ins	Preclean N	Date Cleaned
Material Segmented Block	Joint length Ft	Total length 263.6 Ft	Length Surveyed 263.6 Ft
Lining	Year laid	Year rehabilitated	Weather Dry
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-9
0.0			MWL Water Level			5				
0.0			MGO General Observation							END MH ON VIDEO IS WRONG FC
263.6			MGO General Observation							THIS MH IS NOT ON THE PRINT T
263.6			AMH Manhole							MH-8B
263.6			FH End of Survey							

263.6 Ft Total Length Surveyed

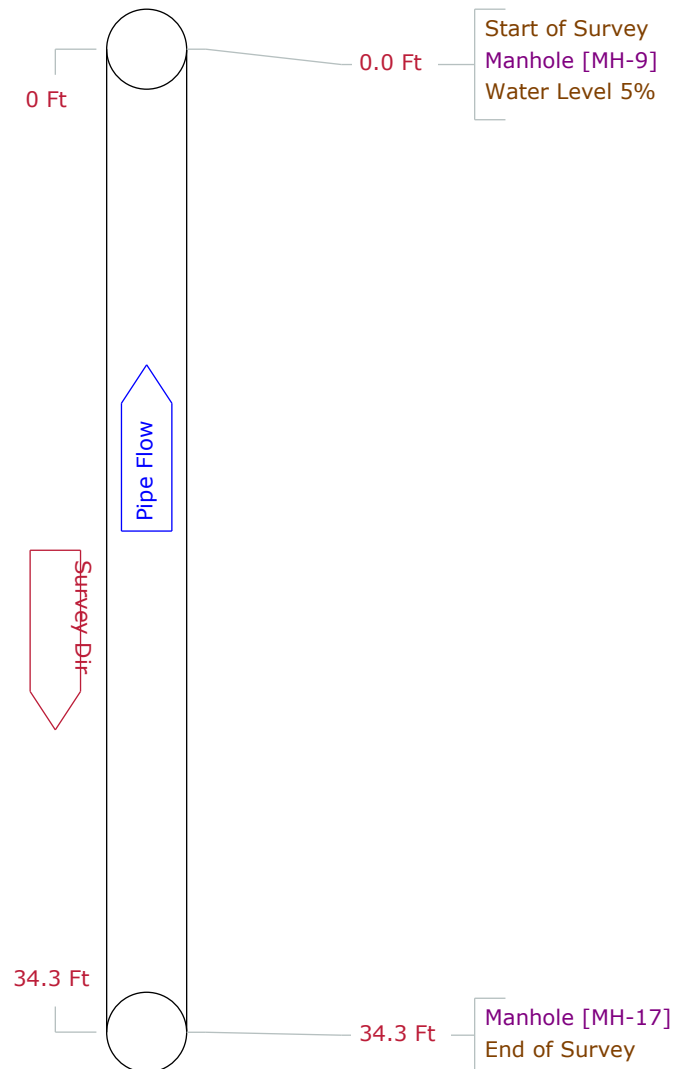
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR MH-17 X for ARCADIS

Setup	31	Surveyor	MS	Certificate #	U-511-12462	System Owner				
Drainage	Survey Customer									
P/O #		Date	2020/12/17	Time	12:14	Street	W MICHIGAN AVE			
City	LANSING	Further location details								
Up	MH-17	Rim to invert		Grade to invert		Rim to grade	Ft			
Down	MH-9	Rim to invert		Grade to invert		Rim to grade	Ft			
Use		Direction	Upstream	Flow control		Media No				
Shape	Circular	Height	36	Width	ins	Preclean	N	Date Cleaned		
Material	Reinforced Concrete Pipe	Joint length		Ft	Total length	34.3	Ft	Length Surveyed	34.30	Ft
Lining		Year laid		Year rehabilitated		Weather		Snow		
Purpose	Cat									
Additional info					Structural			O & M	Constructional	
Location	Light Highway				Miscellaneous		Hydraulic			
Project	WWTP	Work Order								
Northing		Easting			Elevation					
Coordinate System					GPS Accuracy					



Tabular Report of PSR MH-17 X for ARCADIS

Setup 31	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 12:14	Street W MICHIGAN AVE
City LANSING	Further location details		
Up MH-17	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-9	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Up	Flow control	Media No
Shape Circular	Height 36 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 34.3 Ft	Length Surveyed 34.3 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-9
0.0			MWL Water Level			5				
34.3			AMH Manhole							MH-17
34.3			FH End of Survey							

34.3 Ft Total Length Surveyed

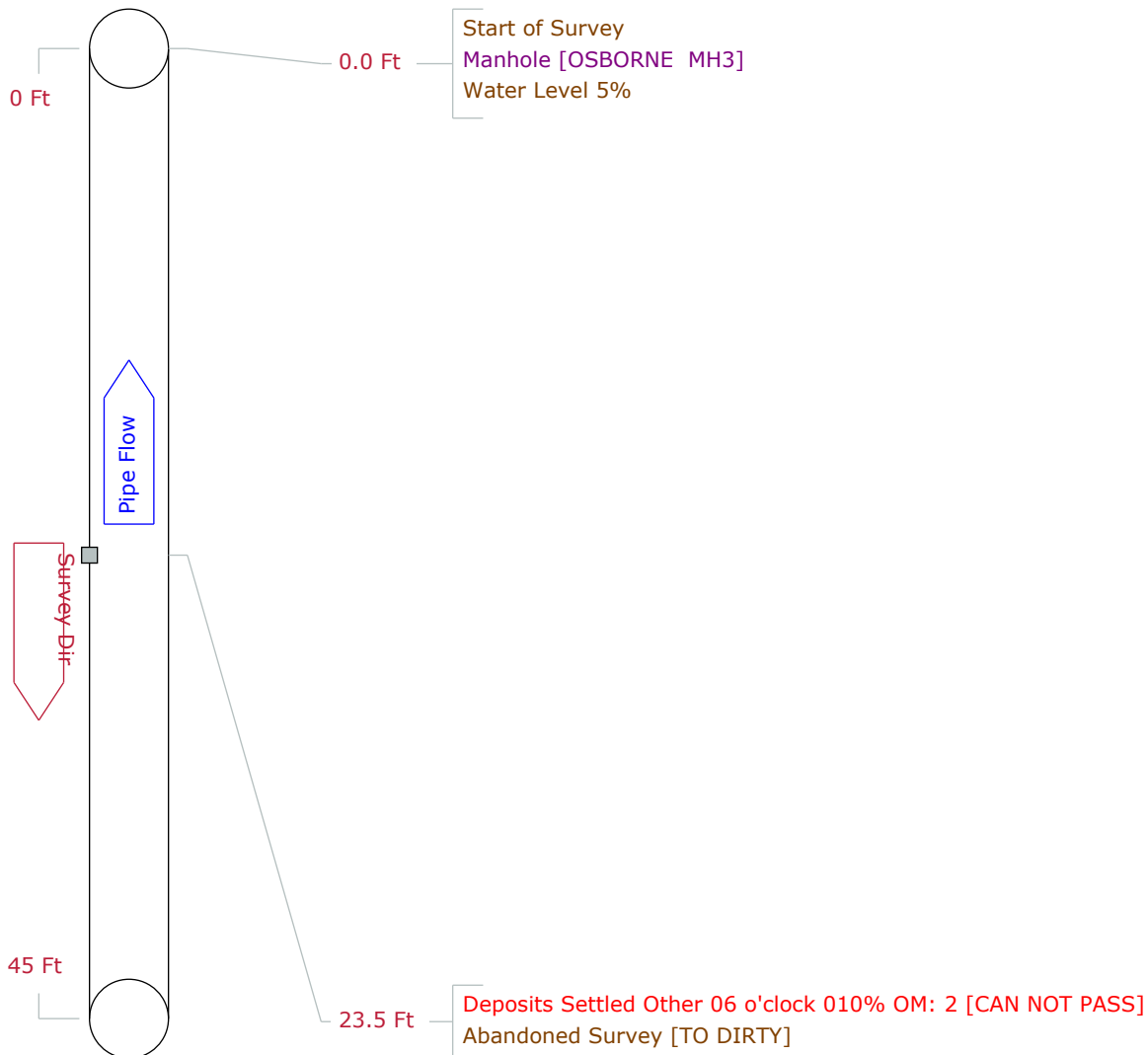
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR OSBORNE MH2 X for ARCADIS

Setup	29/28	Surveyor	MS	Certificate #	U-511-12462	System Owner					
Drainage	Survey Customer										
P/O #	Date		2020/12/17	Time	10:43	Street	OSBORNE RD				
City	LANSING		Further location details								
Up	OSBORNE MH2		Rim to invert		Grade to invert		Rim to grade	Ft			
Down	OSBORNE MH3		Rim to invert		Grade to invert		Rim to grade	Ft			
Use			Direction	Upstream	Flow control		Media No				
Shape	Circular		Height	18	Width	ins	Preclean	N	Date Cleaned		
Material	Vitrified Clay Pipe		Joint length		Ft	Total length	45.0	Ft	Length Surveyed	23.50	Ft
Lining			Year laid		Year rehabilitated		Weather		Snow		
Purpose					Cat						
Additional info		Reverse set up on sheet:28				Structural		O & M	Constructional		
Location	Light Highway						Miscellaneous		Hydraulic		
Project	WWTP						Work Order				
Northing			Easting				Elevation				
Coordinate System						GPS Accuracy					



Tabular Report of PSR OSBORNE MH2 X for ARCADIS

Setup 29	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 10:43	Street OSBORNE RD
City LANSING	Further location details		
Up OSBORNE MH2	Rim to invert	Grade to invert	Rim to grade Ft
Down OSBORNE MH3	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Up	Flow control	Media No
Shape Circular	Height 18 Width	ins Preclean N	Date Cleaned
Material Vitrified Clay Pipe	Joint length	Ft Total length 45.0 Ft	Length Surveyed 23.5 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:28	Structural	O & M
Location Light Highway		Miscellaneous	Constructional
Project WWTP		Work Order	
Northing	Easting	Elevation	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							OSBORNE MH3
0.0			MWL Water Level			5				
23.5			DSZ Deposits Settled Other			10	06			CAN NOT PASS
23.5			MSA Abandoned Survey							TO DIRTY

23.5 Ft Total Length Surveyed

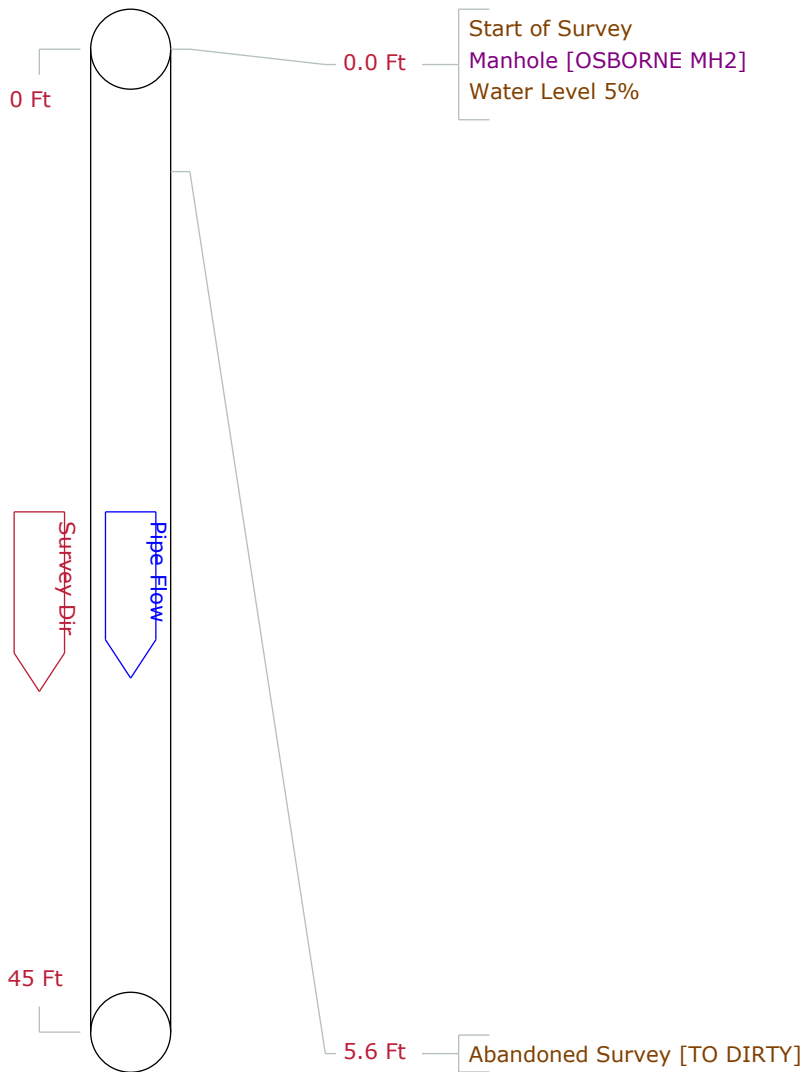
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR OSBORNE MH2 X for ARCADIS

Setup	28/29	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/17		Time 10:40		Street OSBORNE RD	
City	LANSING		Further location details			
Up	OSBORNE MH2		Rim to invert		Grade to invert	Rim to grade Ft
Down	OSBORNE MH3		Rim to invert		Grade to invert	Rim to grade Ft
Use	Direction Downstream		Flow control		Media No	
Shape	Circular		Height 18	Width ins	Preclean N	Date Cleaned
Material	Vitrified Clay Pipe		Joint length Ft	Total length 45.0	Ft	Length Surveyed 05.60 Ft
Lining	Year laid		Year rehabilitated		Weather Snow	
Purpose	Cat					
Additional info					Structural	O & M
Location Light Highway					Miscellaneous	Hydraulic
Project WWTP					Constructional	
Northing					Work Order	
Easting					Elevation	
Coordinate System					GPS Accuracy	



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Tabular Report of PSR OSBORNE MH2 X for ARCADIS

Setup 28	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 10:40	Street OSBORNE RD
City LANSING	Further location details		
Up OSBORNE MH2	Rim to invert	Grade to invert	Rim to grade Ft
Down OSBORNE MH3	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Down	Flow control	Media No
Shape Circular	Height 18 Width	ins Preclean N	Date Cleaned
Material Vitrified Clay Pipe	Joint length	Ft Total length 45.0 Ft	Length Surveyed 5.6 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							OSBORNE MH2
0.0			MWL Water Level			5				
5.6			MSA Abandoned Survey							TO DIRTY

5.6 Ft Total Length Surveyed

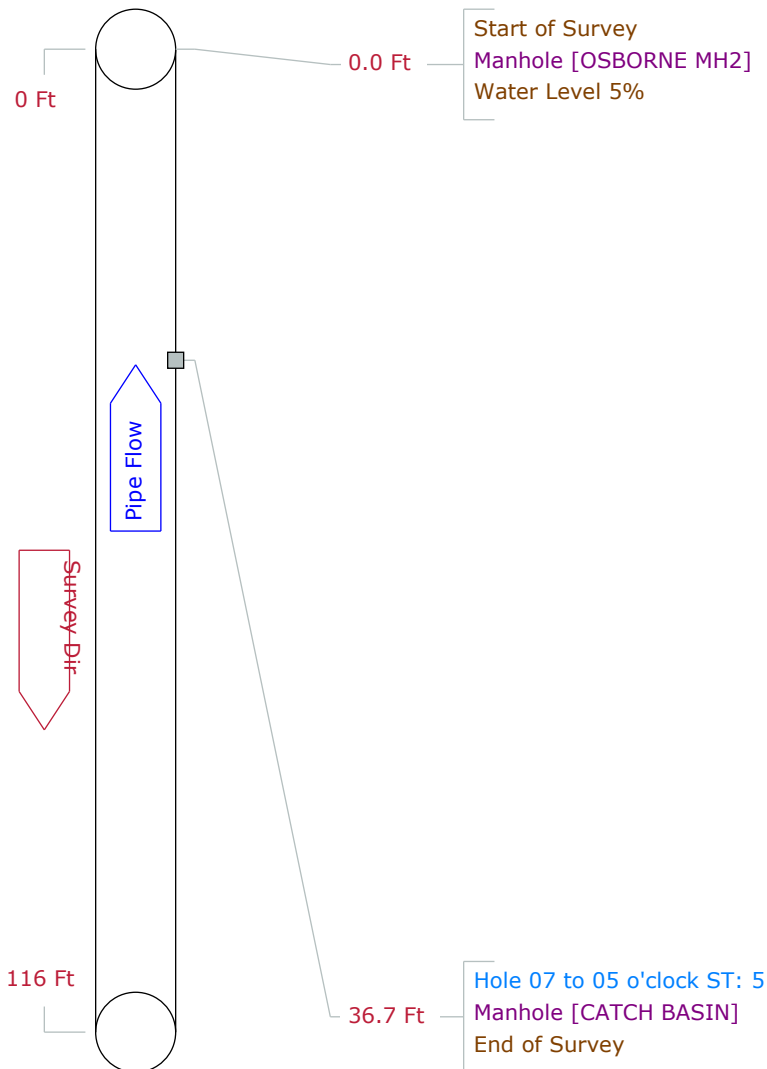
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR OUTFALL MH013 X for ARCADIS

Setup	27/26	Surveyor	MS	Certificate #	U-511-12462	System Owner					
Drainage	Survey Customer										
P/O #	Date		2020/12/17	Time	10:18	Street	OSBORNE RD				
City	LANSING		Further location details								
Up	OUTFALL MH013		Rim to invert		Grade to invert		Rim to grade	Ft			
Down	OSBORNE MH2		Rim to invert		Grade to invert		Rim to grade	Ft			
Use			Direction	Upstream	Flow control		Media No				
Shape	Circular		Height	18	Width	ins	Preclean	N	Date Cleaned		
Material	Vitrified Clay Pipe		Joint length		Ft	Total length	116.0	Ft	Length Surveyed	36.70	Ft
Lining			Year laid		Year rehabilitated		Weather		Snow		
Purpose					Cat						
Additional info		Reverse set up on sheet:26				Structural		O & M	Constructional		
Location	Light Highway						Miscellaneous		Hydraulic		
Project	WWTP						Work Order				
Northing			Easting				Elevation				
Coordinate System						GPS Accuracy					



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Tabular Report of PSR OUTFALL MH013 X for ARCADIS

Setup 27	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 10:18	Street OSBORNE RD
City LANSING	Further location details		
Up OUTFALL MH013	Rim to invert	Grade to invert	Rim to grade Ft
Down OSBORNE MH2	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Up	Flow control	Media No
Shape Circular	Height 18 Width	ins Preclean N	Date Cleaned
Material Vitrified Clay Pipe	Joint length	Ft Total length 116.0 Ft	Length Surveyed 36.7 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:26		Structural O & M Constructional
Location Light Highway			
Project WWTP			Work Order
Northing	Easting		Elevation
Coordinate System			GPS Accuracy

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							OSBORNE MH2
0.0			MWL Water Level			5				
36.7			H Hole				07	05		
36.7			AMH Manhole							CATCH BASIN
36.7			FH End of Survey							

36.7 Ft Total Length Surveyed

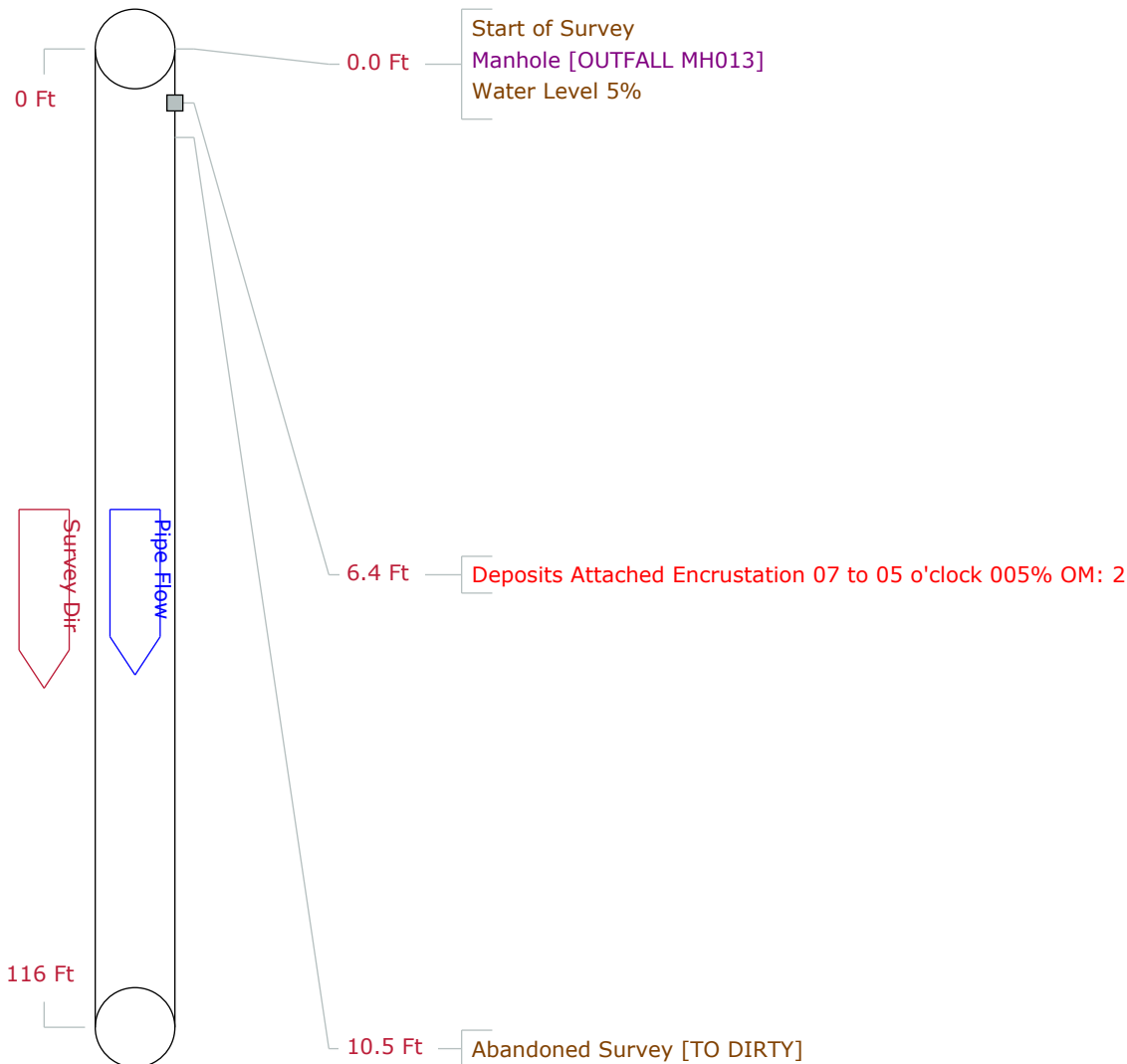
Scores	Structural:	Pipe Rating 5	Pipe Ratings Index 5	Quick Rating 5100
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 5	Pipe Ratings Index 5	Quick Rating 5100



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Pipe Graphic Report of PSR OUTFALL MH013 X for ARCADIS

Setup	26/27	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/17		Time 10:11		Street OSBORNE RD	
City	LANSING		Further location details			
Up	OUTFALL MH013		Rim to invert		Grade to invert	Rim to grade Ft
Down	OSBORNE MH2		Rim to invert		Grade to invert	Rim to grade Ft
Use	Direction Downstream		Flow control		Media No	
Shape	Circular		Height 18	Width ins	Preclean N	Date Cleaned
Material	Vitrified Clay Pipe		Joint length Ft	Total length 116.0 Ft	Length Surveyed 10.50 Ft	
Lining	Year laid		Year rehabilitated		Weather Snow	
Purpose	Cat					
Additional info					Structural	O & M
Location Light Highway					Miscellaneous	Hydraulic
Project WWTP					Constructional	
Northing					Work Order	
Easting					Elevation	
Coordinate System					GPS Accuracy	



Tabular Report of PSR OUTFALL MH013 X for ARCADIS

Setup 26	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 10:11	Street OSBORNE RD
City LANSING	Further location details		
Up OUTFALL MH013	Rim to invert	Grade to invert	Rim to grade Ft
Down OSBORNE MH2	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Down	Flow control	Media No
Shape Circular	Height 18 Width	ins Preclean N	Date Cleaned
Material Vitrified Clay Pipe	Joint length	Ft Total length 116.0 Ft	Length Surveyed 10.5 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							OUTFALL MH013
0.0			MWL Water Level			5				
6.4			DAE Deposits Attached Encrustation			5	J	07	05	
10.5			MSA Abandoned Survey							TO DIRTY

10.5 Ft Total Length Surveyed

Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Tabular Report of PSR MH-01 X for ARCADIS

Setup 25	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 9:25	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-01	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-06	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Down	Flow control	Media No
Shape Circular	Height 30 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 123.0 Ft	Length Surveyed 0.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:24		Structural O & M Constructional
Location Light Highway			
Project WWTP			Work Order
Northing	Easting		Elevation
Coordinate System			GPS Accuracy

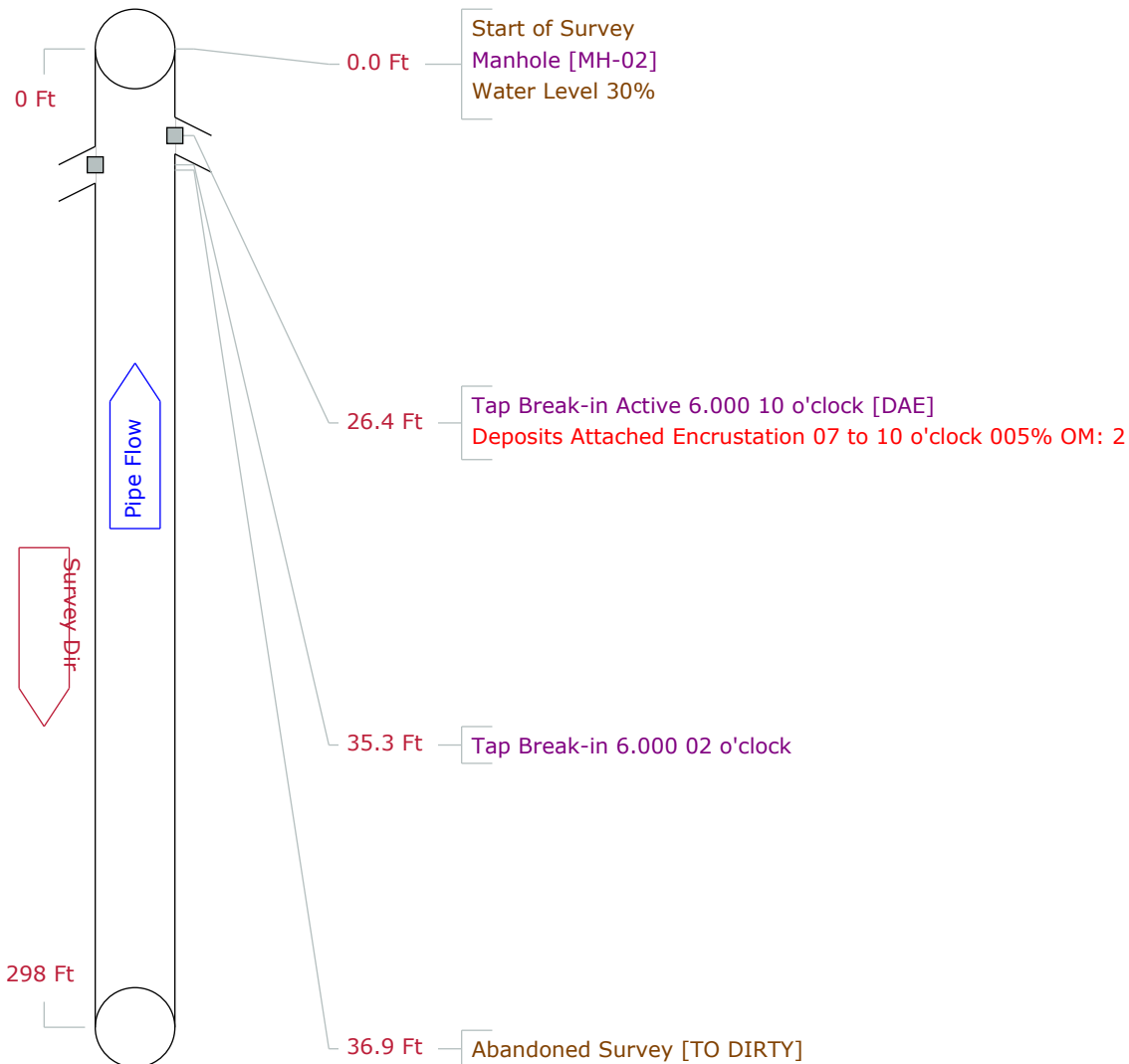
Count Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST Start of Survey							
0.0		AMH Manhole							MH-01
0.0		MWL Water Level			5				

0.0 Ft Total Length Surveyed

Scores	Structural:	Pipe Rating	Pipe Ratings Index	Quick Rating
	O&M:	Pipe Rating	Pipe Ratings Index	Quick Rating
	Overall	Pipe Rating	Pipe Ratings Index	Quick Rating

Pipe Graphic Report of PSR MH-06 X for ARCADIS

Setup	22/23 Surveyor	MS	Certificate #	U-511-12462	System Owner			
Drainage	Survey Customer							
P/O #	Date	2020/12/17	Time	8:41	Street	N VERLINDEN AVE		
City	LANSING	Further location details						
Up	MH-06	Rim to invert		Grade to invert		Rim to grade	Ft	
Down	MH-02	Rim to invert		Grade to invert		Rim to grade	Ft	
Use	Stormwater	Direction	Upstream	Flow control		Media	No	
Shape	Circular	Height	30	Width	ins	Preclean	N	Date Cleaned
Material	Segmented Block	Joint length		Ft	Total length	298.0 Ft	Length Surveyed	36.90 Ft
Lining		Year laid		Year rehabilitated		Weather	Snow	
Purpose	Cat							
Additional info					Structural	O & M	Constructional	
Location	Light Highway			Miscellaneous	Hydraulic			
Project	WWTP	Work Order						
Northing		Easting		Elevation				
Coordinate System		GPS Accuracy						



Tabular Report of PSR MH-06 X for ARCADIS

Setup 22	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 8:41	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-06	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-02	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 30	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 298.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-02
0.0			MWL Water Level			30				
26.4			TBA Tap Break-in Active	6.000			10			DAE
26.4			DAE Deposits Attached Encrustation			5	07	10		
35.3			TB Tap Break-in	6.000			02			
36.9			MSA Abandoned Survey							TO DIRTY

36.9 Ft Total Length Surveyed

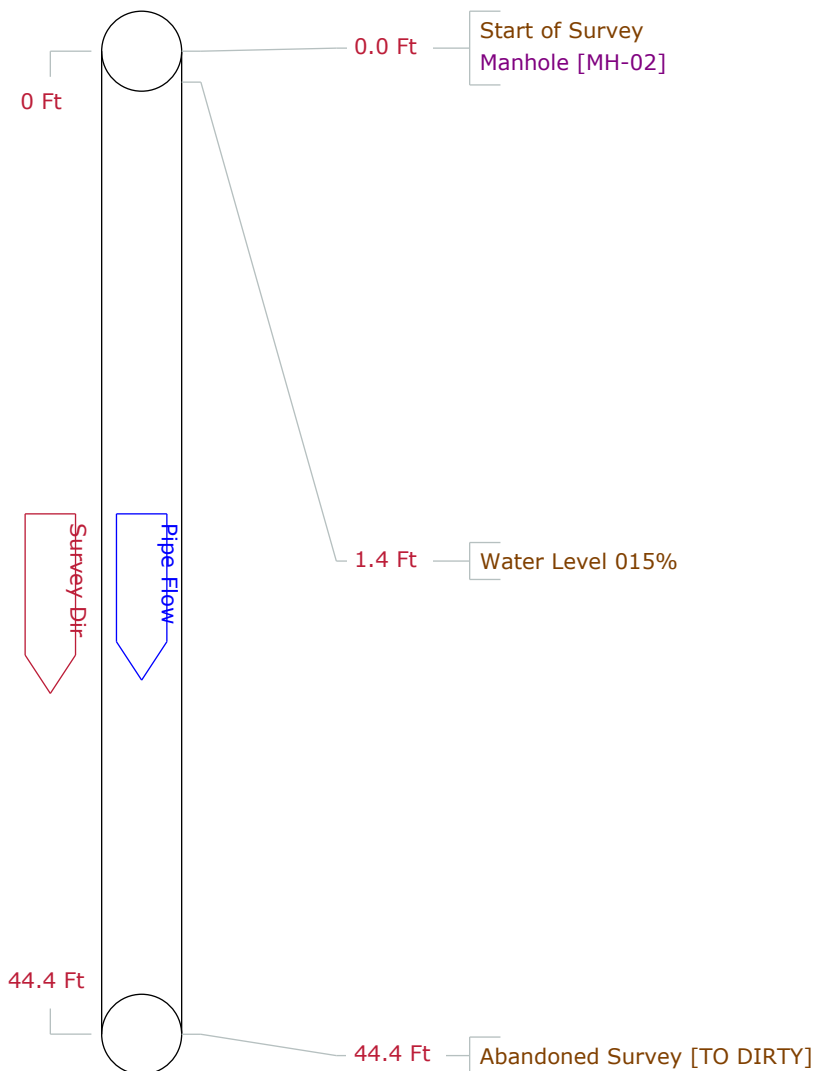
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH-02 X for ARCADIS

Setup	21	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/17		Time 8:23	Street N VERLINDEN AVE		
City	LANSING	Further location details				
Up	MH-02	Rim to invert		Grade to invert	Rim to grade	Ft
Down	MH-07	Rim to invert		Grade to invert	Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control	Media No	
Shape	Circular	Height	30	Width	ins	Preclean N
Material	Segmented Block	Joint length		Ft	Total length 44.4	Ft
Lining		Year laid		Year rehabilitated	Weather Snow	
Purpose	Cat					
Additional info				Structural	O & M	Constructional
Location	Light Highway			Miscellaneous	Hydraulic	
Project	WWTP	Work Order				
Northing		Easting		Elevation		
Coordinate System				GPS Accuracy		



Tabular Report of PSR MH-02 X for ARCADIS

Setup 21	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 8:23	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-02	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-07	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 30	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 44.4 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-02
1.4			MWL Water Level			15				
44.4			MSA Abandoned Survey							TO DIRTY

44.4 Ft Total Length Surveyed

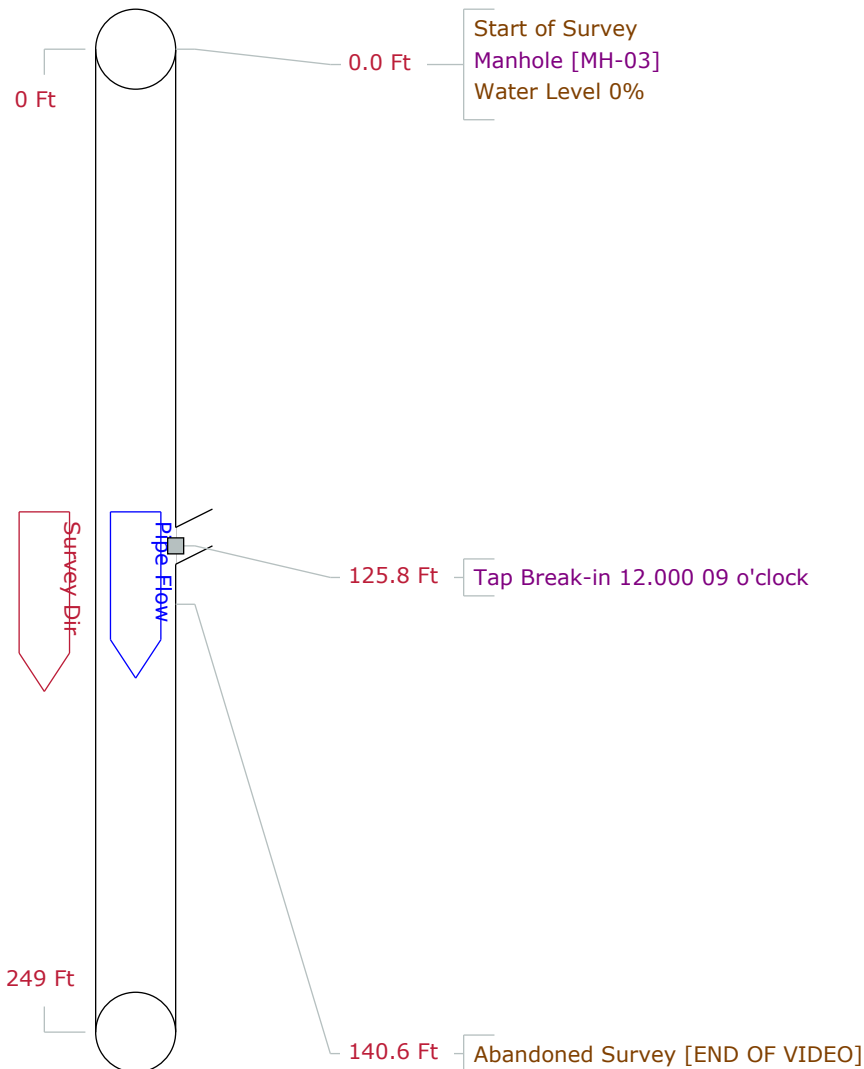
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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Pipe Graphic Report of PSR MH-03 X for ARCADIS

Setup	18/17	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 3:01		Street N VERLINDEN AVE	
City	LANSING		Further location details			
Up	MH-03		Rim to invert		Grade to invert	Rim to grade Ft
Down	MH04		Rim to invert		Grade to invert	Rim to grade Ft
Use	Stormwater		Direction	Downstream	Flow control	Media No
Shape	Circular		Height	48	Width ins	Preclean N Date Cleaned
Material	Segmented Block		Joint length	Ft	Total length	249.0 Ft Length Surveyed 140.60 Ft
Lining			Year laid		Year rehabilitated	Weather Snow
Purpose			Cat			
Additional info	Reverse set up on sheet:17				Structural	O & M
Location	Easement/Right of Way				Miscellaneous	Hydraulic
Project	WWTP				Work Order	
Northing	Easting				Elevation	
Coordinate System					GPS Accuracy	



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Tabular Report of PSR MH-03 X for ARCADIS

Setup 18	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 3:01	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-03	Rim to invert	Grade to invert	Rim to grade Ft
Down MH04	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 249.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:17		Structural O & M Constructional
Location	Easement/Right of Way		Miscellaneous
Project WWTP	Work Order		
Northing	Easting		Elevation
Coordinate System	GPS Accuracy		

Count Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST Start of Survey							
0.0		AMH Manhole							MH-03
0.0		MWL Water Level			0				
125.8		TB Tap Break-in	12.000			09			
140.6		MSA Abandoned Survey							END OF VIDEO

140.6 Ft Total Length Surveyed

Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	Overall	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000



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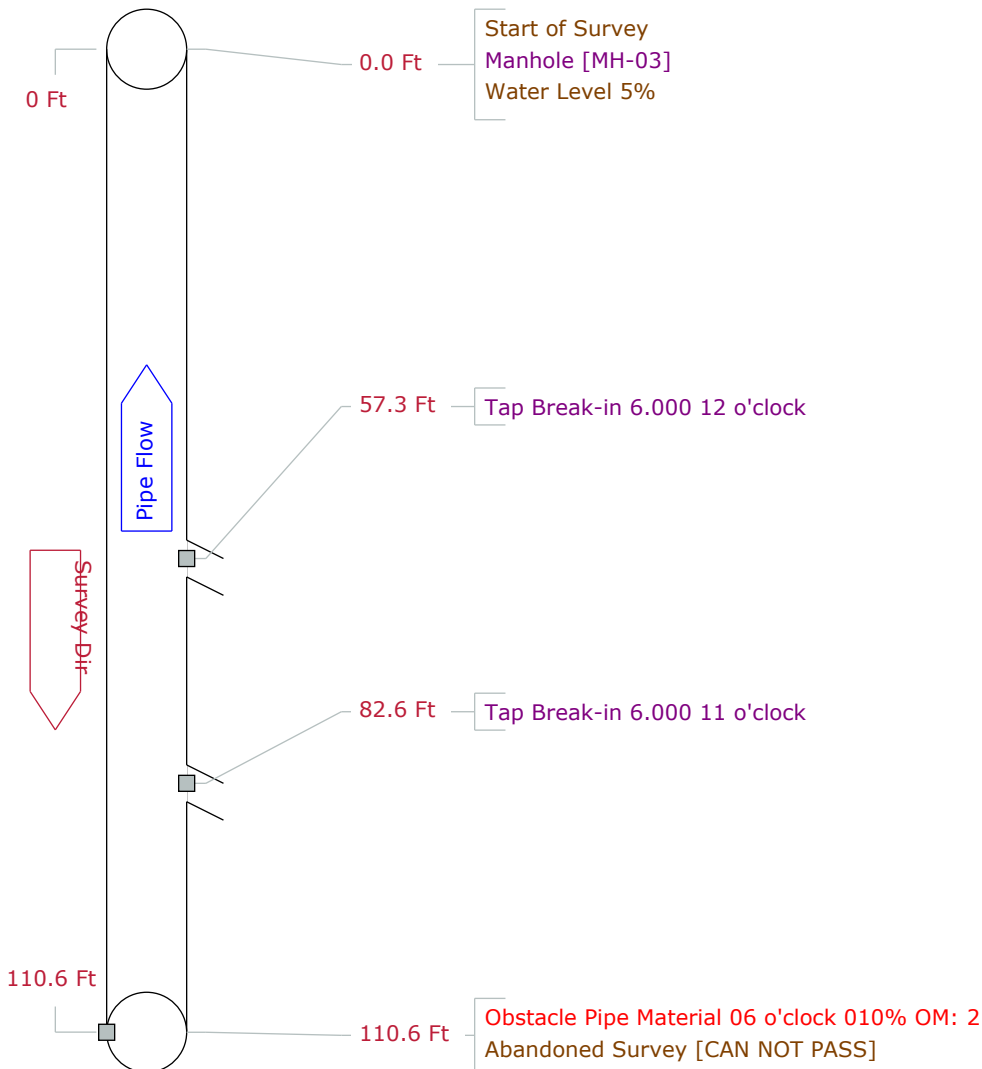
Pipe Graphic Report of PSR MH-08

X

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Setup	19/20 Surveyor	MS	Certificate #	U-511-12462	System Owner				
Drainage	Survey Customer								
P/O #	Date	2020/12/16	Time	15:19	Street	N VERLINDEN AVE			
City	LANSING	Further location details							
Up	MH-08	Rim to invert		Grade to invert		Rim to grade	Ft		
Down	MH-03	Rim to invert		Grade to invert		Rim to grade	Ft		
Use	Stormwater	Direction	Upstream	Flow control		Media No			
Shape	Circular	Height	30	Width	ins	Preclean	N	Date Cleaned	
Material	Segmented Block	Joint length		Ft	Total length	Ft	Length Surveyed	110.60 Ft	
Lining		Year laid		Year rehabilitated		Weather			
Purpose	Cat								
Additional info					Structural			O & M	Constructional
Location					Miscellaneous			Hydraulic	
Project	WWTP	Work Order							
Northing			Easting		Elevation				
Coordinate System					GPS Accuracy				



Tabular Report of PSR MH-08 X for ARCADIS

Setup 19	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 15:19	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-08	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-03	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 30	Width ins	Preclean N
Material Segmented Block	Joint length Ft	Total length Ft	Length Surveyed 110.6 Ft
Lining	Year laid	Year rehabilitated	Weather
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location		Miscellaneous	
Project WWTP		Work Order	
Northing	Easting	Elevation	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-03
0.0			MWL Water Level			5				
57.3			TB Tap Break-in	6.000			12			
82.6			TB Tap Break-in	6.000			11			
110.6			OBM Obstacle Pipe Material			10	06			
110.6			MSA Abandoned Survey							CAN NOT PASS

110.6 Ft Total Length Surveyed

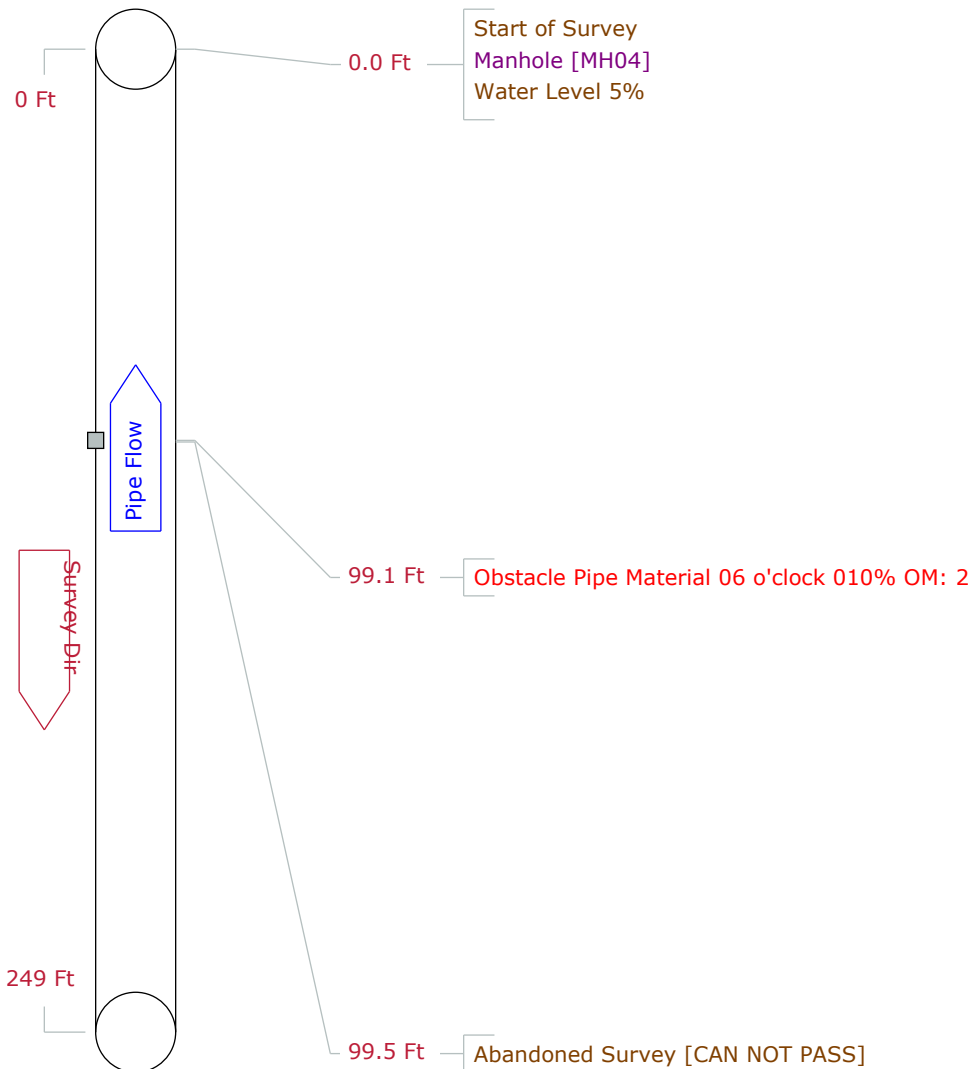
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH-03 X for ARCADIS

Setup	17/18 Surveyor	MS	Certificate #	U-511-12462	System Owner			
Drainage	Survey Customer							
P/O #	Date	2020/12/16	Time	14:52	Street	N VERLINDEN AVE		
City	LANSING	Further location details						
Up	MH-03	Rim to invert		Grade to invert		Rim to grade	Ft	
Down	MH04	Rim to invert		Grade to invert		Rim to grade	Ft	
Use	Stormwater	Direction	Upstream	Flow control		Media	No	
Shape	Circular	Height	48	Width	ins	Preclean	N	Date Cleaned
Material	Segmented Block	Joint length		Ft	Total length	249.0 Ft	Length Surveyed	99.50 Ft
Lining		Year laid		Year rehabilitated		Weather	Snow	
Purpose	Cat							
Additional info					Structural	O & M	Constructional	
Location	Easement/Right of Way				Miscellaneous	Hydraulic		
Project	WWTP	Work Order						
Northing	Easting			Elevation				
Coordinate System			GPS Accuracy					



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Tabular Report of PSR MH-03 X for ARCADIS

Setup 17	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 14:52	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-03	Rim to invert	Grade to invert	Rim to grade Ft
Down MH04	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No
Shape Circular	Height 48	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 249.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Easement/Right of Way		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH04
0.0			MWL Water Level			5				
99.1			OBM Obstacle Pipe Material			10	06			
99.5			MSA Abandoned Survey							CAN NOT PASS

99.5 Ft Total Length Surveyed

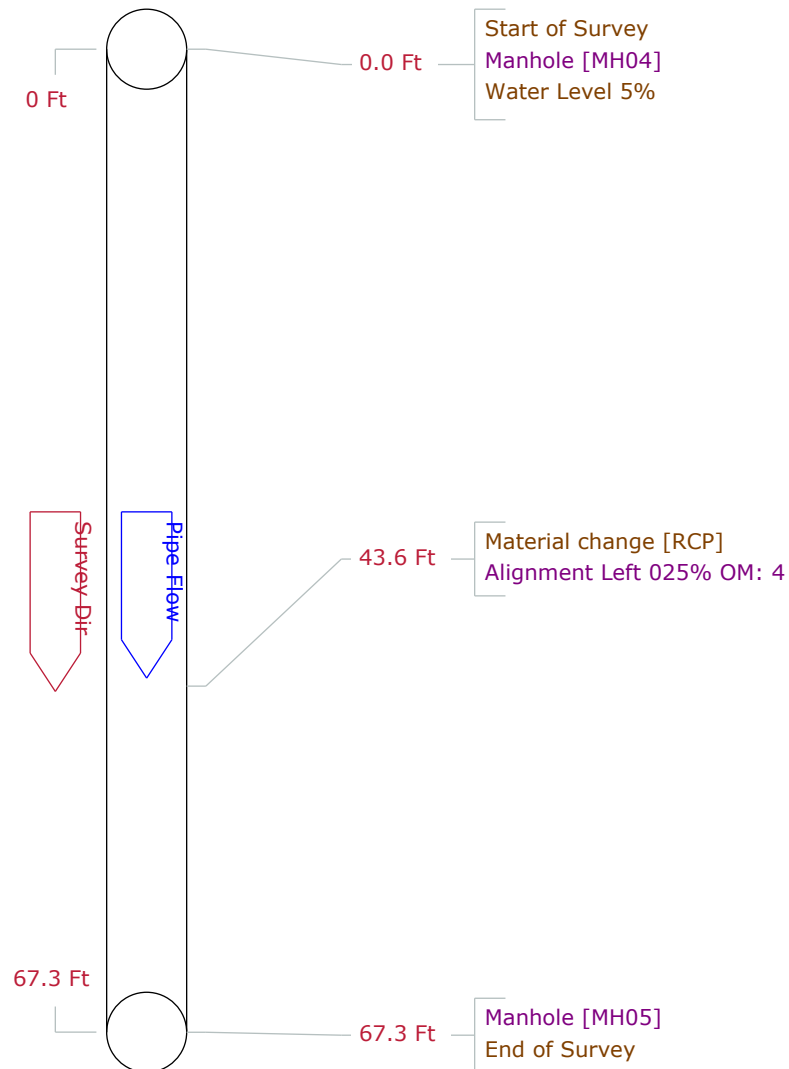
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
	Overall	Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100



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Pipe Graphic Report of PSR MH04 X for ARCADIS

Setup	16	Surveyor	MS	Certificate #	U-511-12462	System Owner
Drainage	Survey Customer					
P/O #	Date 2020/12/16		Time 14:45		Street N VERLINDEN AVE	
City	LANSING		Further location details			
Up	MH04		Rim to invert		Grade to invert	
Down	MH05		Rim to invert		Grade to invert	
Use	Stormwater		Direction Downstream		Flow control	
Shape	Circular		Height 48		Media No	
			Width		ins	
Material	Segmented Block		Joint length		Ft	
			Total length 67.3		Ft	
Lining			Year laid		Weather Snow	
Purpose			Year rehabilitated		Cat	
Additional info					Structural	
Location					Easement/Right of Way	
Project					WWTP	
Northing					Easting	
Coordinate System					GPS Accuracy	



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Tabular Report of PSR MH04 X for ARCADIS

Setup 16	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/16	Time 14:45	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH04	Rim to invert	Grade to invert	Rim to grade Ft
Down MH05	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 48 Width	ins Preclean N	Date Cleaned
Material Segmented Block	Joint length	Ft Total length 67.3 Ft	Length Surveyed 67.3 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Easement/Right of Way		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH04
0.0			MWL Water Level			5				
43.6			MMC Material change							RCP
43.6			LL Alignment Left			25				
67.3			AMH Manhole							MH05
67.3			FH End of Survey							

67.3 Ft Total Length Surveyed

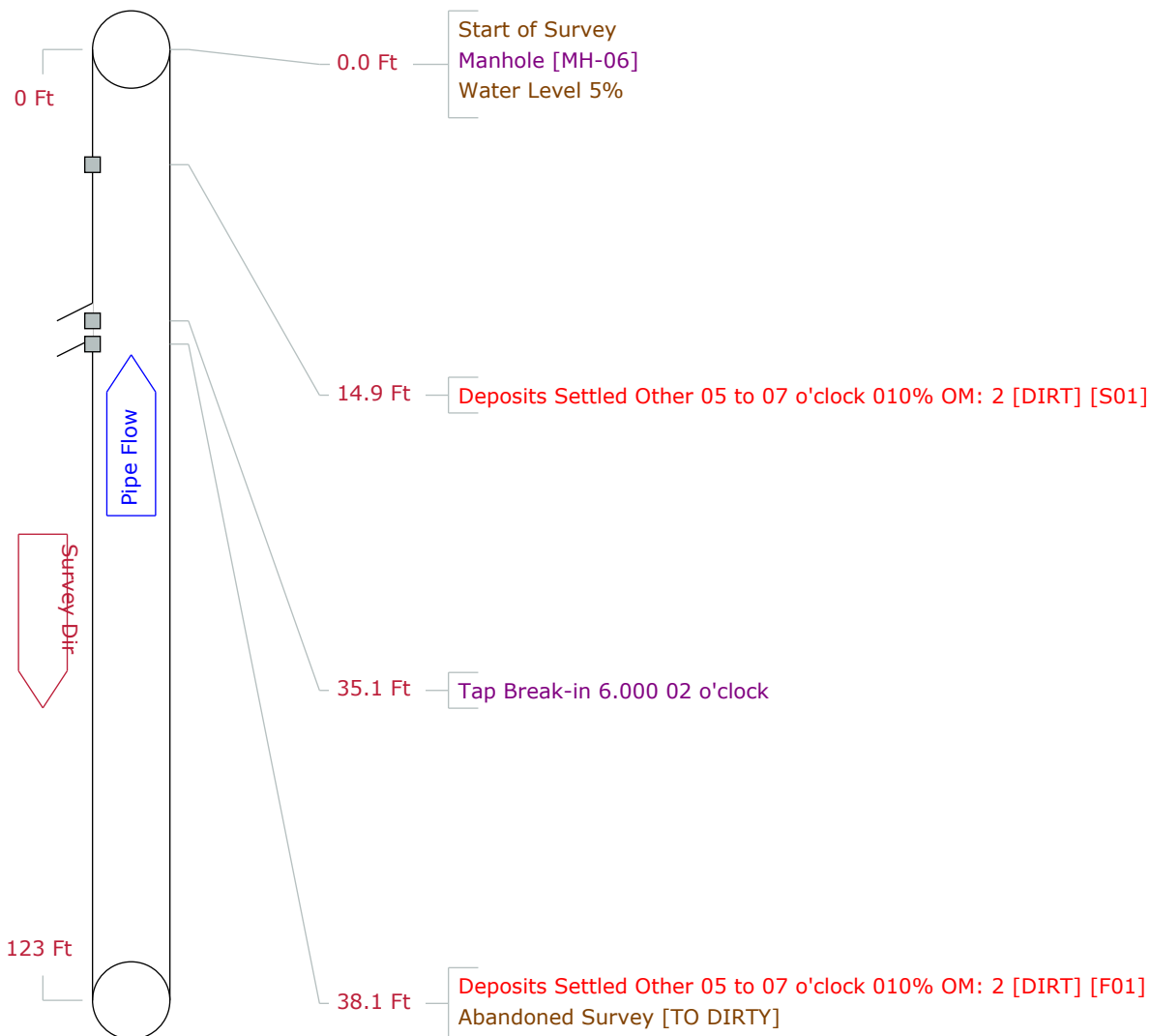
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 4	Pipe Ratings Index 4	Quick Rating 4100
	Overall	Pipe Rating 4	Pipe Ratings Index 4	Quick Rating 4100



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Phone:810-789-7155

Pipe Graphic Report of PSR MH-01 X for ARCADIS

Setup	24/25 Surveyor	MS	Certificate #	U-511-12462	System Owner					
Drainage	Survey Customer									
P/O #	Date	2020/12/17	Time	9:06	Street	N VERLINDEN AVE				
City	LANSING	Further location details								
Up	MH-01	Rim to invert		Grade to invert		Rim to grade	Ft			
Down	MH-06	Rim to invert		Grade to invert		Rim to grade	Ft			
Use	Direction		Upstream	Flow control		Media	No			
Shape	Circular	Height	30	Width	ins	Preclean	N	Date Cleaned		
Material	Reinforced Concrete Pipe		Joint length	Ft	Total length	123.0	Ft	Length Surveyed	38.10	Ft
Lining	Year laid		Year rehabilitated		Weather		Snow			
Purpose	Cat									
Additional info					StructuralO & MConstructional					
Location	Light Highway				MiscellaneousHydraulic					
Project	WWTP				Work Order					
Northing	Easting				Elevation					
Coordinate System					GPS Accuracy					



Tabular Report of PSR MH-01 X for ARCADIS

Setup 24	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 9:06	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-01	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-06	Rim to invert	Grade to invert	Rim to grade Ft
Use	Direction Up	Flow control	Media No
Shape Circular	Height 30 Width	ins Preclean N	Date Cleaned
Material Reinforced Concrete Pipe	Joint length	Ft Total length 123.0 Ft	Length Surveyed 38.1 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info		Structural O & M Constructional	
Location Light Highway		Miscellaneous	
Project WWTP		Work Order	
Northing		Easting	
Coordinate System		GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-06
0.0			MWL Water Level			5				
14.9		S01	DSZ Deposits Settled Other			10	05	07		DIRT
35.1			TB Tap Break-in	6.000			02			
38.1		F01	DSZ Deposits Settled Other			10	05	07		DIRT
38.1			MSA Abandoned Survey							TO DIRTY

38.1 Ft Total Length Surveyed

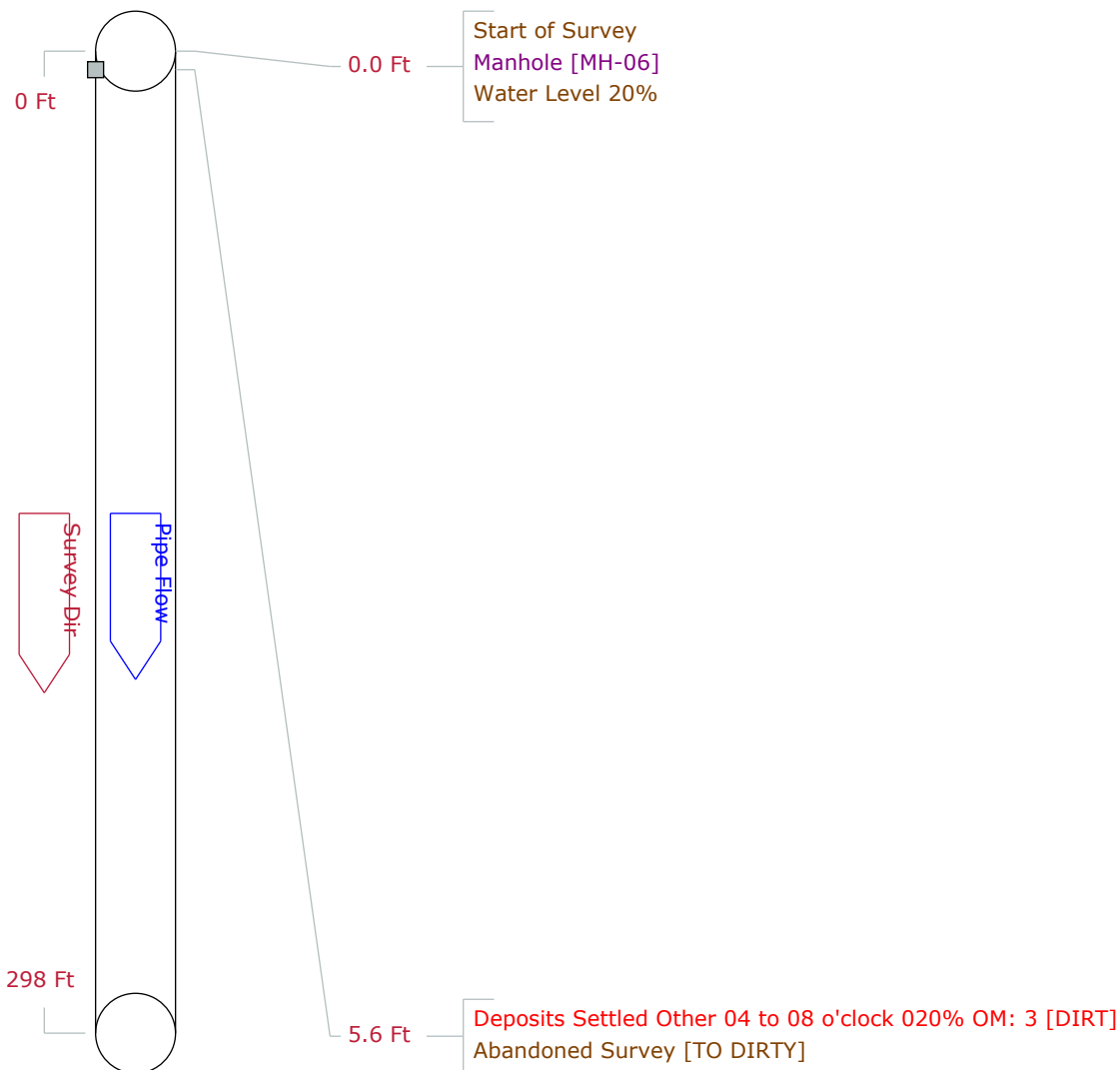
Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 10	Pipe Ratings Index 2	Quick Rating 2500
	Overall	Pipe Rating 10	Pipe Ratings Index 2	Quick Rating 2500



YOUNGS ENVIRONMENTAL CLEAN UP
Phone: 810-789-7155

Pipe Graphic Report of PSR MH-06 X for ARCADIS

Setup	23/22	Surveyor	MS	Certificate #	U-511-12462	System Owner				
Drainage	Survey Customer									
P/O #	Date 2020/12/17		Time 8:59		Street N VERLINDEN AVE					
City	LANSING		Further location details							
Up	MH-06		Rim to invert		Grade to invert	Rim to grade	Ft			
Down	MH-02		Rim to invert		Grade to invert	Rim to grade	Ft			
Use	Stormwater		Direction	Downstream	Flow control		Media No			
Shape	Circular		Height	30	Width	ins	Preclean N	Date Cleaned		
Material	Segmented Block		Joint length		Ft	Total length	298.0 Ft	Length Surveyed	05.60	Ft
Lining			Year laid		Year rehabilitated		Weather			Snow
Purpose					Cat					
Additional info		Reverse set up on sheet:22				Structural		O & M	Constructional	
Location	Light Highway						Miscellaneous		Hydraulic	
Project	WWTP						Work Order			
Northing			Easting				Elevation			
Coordinate System						GPS Accuracy				



Tabular Report of PSR MH-06 X for ARCADIS

Setup 23	Surveyor MS	Certificate # U-511-12462	System Owner
Drainage	Survey Customer		
P/O #	Date 2020/12/17	Time 8:59	Street N VERLINDEN AVE
City LANSING	Further location details		
Up MH-06	Rim to invert	Grade to invert	Rim to grade Ft
Down MH-02	Rim to invert	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Down	Flow control	Media No
Shape Circular	Height 30	Width ins	Preclean N
Material Segmented Block	Joint length	Ft	Total length 298.0 Ft
Lining	Year laid	Year rehabilitated	Weather Snow
Purpose	Cat		Pressure
Additional info	Reverse set up on sheet:22		Structural O & M Constructional
Location Light Highway			Miscellaneous
Project WWTP	Work Order		
Northing	Easting	Elevation	
Coordinate System	GPS Accuracy		

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH-06
0.0			MWL Water Level			20				
5.6			DSZ Deposits Settled Other			20	04	08		DIRT
5.6			MSA Abandoned Survey							TO DIRTY

5.6 Ft Total Length Surveyed

Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 3	Pipe Ratings Index 3	Quick Rating 3100
	Overall	Pipe Rating 3	Pipe Ratings Index 3	Quick Rating 3100



YOUNGS ENVIRONMENTAL CLEAN UP
Phone:810-789-7155

APPENDIX D

Analytical Results



The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81615

Sampling Dates: 12/09/20 - 12/10/20

Report to:

Arcadis
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ATTN: Alex Villhauer

Total number of pages in report: **101**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Arcadis

Job No: FA81615

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

FA81615-1	12/09/20	09:03	AMEW12/11/20	AQ	Water	MICHAVE-MH-3_120920
FA81615-1D	12/09/20	09:03	AMEW12/11/20	AQ	Water Dup/MSD	MICHAVE-MH-3_120920
FA81615-1S	12/09/20	09:03	AMEW12/11/20	AQ	Water Matrix Spike	MICHAVE-MH-3_120920
FA81615-2	12/09/20	09:40	AMEW12/11/20	AQ	Water	MICHAVE-MH-4_120920
FA81615-3	12/09/20	10:04	AMEW12/11/20	AQ	Water	VERLINDEN-MH-5_120920
FA81615-4	12/09/20	10:20	AMEW12/11/20	AQ	Water	VERLINDEN-MH-4_120920
FA81615-5	12/09/20	10:45	AMEW12/11/20	AQ	Water	VERLINDEN-MH-3_120920
FA81615-6	12/09/20	11:03	AMEW12/11/20	AQ	Water	VERLINDEN-MH-2_120920
FA81615-7	12/09/20	11:16	AMEW12/11/20	AQ	Water	VERLINDEN-MH-1_120920
FA81615-8	12/09/20	12:08	AMEW12/11/20	AQ	Water	OSBORN-MH-1_120920
FA81615-9	12/09/20	00:00	AMEW12/11/20	AQ	Water	DUP-01_120920
FA81615-10	12/09/20	12:39	AMEW12/11/20	AQ	Water	P6-MH-19_120920



Sample Summary
(continued)

Arcadis

Job No: FA81615

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA81615-11	12/09/20	13:05 AMEW	12/11/20	AQ	Water	P6-MH-18_120920
FA81615-12	12/09/20	13:24 AMEW	12/11/20	AQ	Water	P6-MH-17_120920
FA81615-13	12/09/20	13:50 AMEW	12/11/20	AQ	Water	P6-MH-16_120920
FA81615-14	12/09/20	15:15 AMEW	12/11/20	AQ	Water	P3-MH-290_120920
FA81615-15	12/09/20	14:55 AMEW	12/11/20	AQ	Water	P3-MH-297_120920
FA81615-16	12/09/20	15:35 AMEW	12/11/20	AQ	Water	P3-MH-284_120920
FA81615-17	12/09/20	00:00 AMEW	12/11/20	AQ	Water	DUP-02_120920
FA81615-18	12/10/20	09:05 AMEW	12/11/20	AQ	Water	P2-MH-2_121020
FA81615-19	12/10/20	09:20 AMEW	12/11/20	AQ	Water	P2-MH-30_121020
FA81615-20	12/10/20	11:50 AMEW	12/11/20	AQ	Water	P2-CB-32_121020
FA81615-20D	12/10/20	11:50 AMEW	12/11/20	AQ	Water Dup/MSD	P2-CB-32_121020
FA81615-20S	12/10/20	11:50 AMEW	12/11/20	AQ	Water Matrix Spike	P2-CB-32_121020
FA81615-21	12/10/20	12:10 AMEW	12/11/20	AQ	Water	P2-MH-26_121020



Sample Summary
(continued)

Arcadis

Job No: FA81615

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA81615-22	12/10/20	12:15 AMEW	12/11/20	AQ	Field Blank Water	FB-01_121020
FA81615-23	12/10/20	12:20 AMEW	12/11/20	AQ	Equipment Blank	EB-01_121020
FA81615-24	12/10/20	09:43 AMEW	12/11/20	AQ	Water	P2-MH-NW_121020
FA81615-25	12/10/20	10:05 AMEW	12/11/20	AQ	Water	P2-MH-14_121020
FA81615-26	12/10/20	10:55 AMEW	12/11/20	AQ	Water	P2-MH-25_121020
FA81615-27	12/10/20	11:25 AMEW	12/11/20	AQ	Water	P2-MH-W_121020
FA81615-28	12/10/20	00:00 AMEW	12/11/20	AQ	Water	DUP-03_121020

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA81615-1 MICHAVE-MH-3_120920

Perfluorobutanoic acid	0.0044	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0030	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0026	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0014 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-2 MICHAVE-MH-4_120920

Perfluorobutanoic acid	0.0096	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0078	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0077	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0091	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0161	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0017 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0019 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0126	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-3 VERLINDEN-MH-5_120920

Perfluorobutanoic acid	0.0209	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0685	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0510	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0315	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0439	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0034	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0015 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0013 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0122	0.0020	0.0010	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	0.0167	0.0080	0.0020	ug/l	EPA 537M BY ID

FA81615-4 VERLINDEN-MH-4_120920

Perfluorobutanoic acid	0.0438	0.0042	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.183	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.116	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0457	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0351	0.0021	0.0010	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

Perfluorononanoic acid		0.0029	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0015 J	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0055	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0014 J	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0021	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0169	0.0021	0.0010	ug/l	EPA 537M BY ID

FA81615-5 VERLINDEN-MH-3_120920

Perfluorobutanoic acid		0.0347	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.144	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0964	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0438	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0314	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0028	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0076	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0111	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-6 VERLINDEN-MH-2_120920

Perfluorobutanoic acid		0.0222	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0774	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.120	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0431	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0215	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0019 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0021	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0092	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-7 VERLINDEN-MH-1_120920

Perfluorobutanoic acid		0.0177	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0340	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0316	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0217	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0405	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0024	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0040	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0021	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

Perfluorooctanesulfonic acid		0.0081	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-8 OSBORN-MH-1_120920

Perfluorobutanoic acid	0.0203	0.0042	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0247	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0221	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0182	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0397	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0058	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0047	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0020 J	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0016 J	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0240	0.0021	0.0010	ug/l	EPA 537M BY ID

FA81615-9 DUP-01_120920

Perfluorobutanoic acid	0.0357	0.0042	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.155	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.102	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0454	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0321	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0026	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0071	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0035	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0113	0.0021	0.0010	ug/l	EPA 537M BY ID

FA81615-10 P6-MH-19_120920

Perfluorobutanoic acid	0.0391	0.0045	0.0023	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.135	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.112	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0608	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0871	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0056	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0080	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluoroundecanoic acid	0.0016 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorododecanoic acid	0.0015 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0021 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0038	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0011 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0116	0.0023	0.0011	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA81615-11 P6-MH-18_120920

Perfluorobutanoic acid	0.0171	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0264	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0306	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0225	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0619	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0058	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0014 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0139	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-12 P6-MH-17_120920

Perfluorobutanoic acid	0.0312	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0551	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0544	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0595	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.120	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0157	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0095	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0039	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0291	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-13 P6-MH-16_120920

Perfluorobutanoic acid	0.0220	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0263	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0293	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0203	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0459	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0017 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0015 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0186	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid	0.0022	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-14 P3-MH-290_120920

Perfluorobutanoic acid	0.0029 J	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0020	0.0020	0.0010	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA81615-15 P3-MH-297_120920

Perfluorooctanesulfonic acid	0.0024	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-16 P3-MH-284_120920

Perfluorobutanoic acid	0.0030 J	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0010 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-17 DUP-02_120920

Perfluorobutanoic acid	0.0027 J	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID

FA81615-18 P2-MH-2_121020

Perfluorobutanoic acid	0.0066	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0041	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0031	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0069	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0105	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0028	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0101	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-19 P2-MH-30_121020

Perfluorobutanoic acid	0.0080	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0024	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0066	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0012 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.106	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0029	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0103	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid	0.0059	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0847	0.0019	0.00093	ug/l	EPA 537M BY ID

FA81615-20 P2-CB-32_121020

Perfluorobutanoic acid	0.0119	0.0038	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0017 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0011 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0011 J	0.0019	0.00096	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

Perfluorobutanesulfonic acid	0.0014 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0032	0.0019	0.00096	ug/l	EPA 537M BY ID

FA81615-21 P2-MH-26_121020

Perfluorobutanoic acid	0.0067	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0056	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0054	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0049	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0103	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0020	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0067	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-22 FB-01_121020

No hits reported in this sample.

FA81615-23 EB-01_121020

No hits reported in this sample.

FA81615-24 P2-MH-NW_121020

Perfluorobutanoic acid	0.0060	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0036	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0027	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0059	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0018 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0015 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0090	0.0020	0.0010	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	0.0021 J	0.0080	0.0020	ug/l	EPA 537M BY ID

FA81615-25 P2-MH-14_121020

Perfluorobutanoic acid	0.0178	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0244	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0184	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0162	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0308	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0034	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81615
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/09/20 thru 12/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

Perfluorohexanesulfonic acid		0.0150	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0788	0.0020	0.0010	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0033 J	0.0080	0.0020	ug/l	EPA 537M BY ID

FA81615-26 P2-MH-25_121020

Perfluorobutanoic acid		0.0083	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0073	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0069	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0065	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0132	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0013 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0018 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0013 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0073	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-27 P2-MH-W_121020

Perfluorobutanoic acid		0.0031 J	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0026	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-28 DUP-03_121020

Perfluorobutanoic acid		0.0083	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0074	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0068	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0063	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0140	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0077	0.0020	0.0010	ug/l	EPA 537M BY ID



Orlando, FL

Section 3



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MICHAVE-MH-3_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-1	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9269.D	1	12/17/20 02:33	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0044	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0023	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0016	0.0020	0.0010	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0012	0.0020	0.0010	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0030	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid ^a	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid ^a	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0026	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MICHAVE-MH-3_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-1	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%		35-135%
	13C5-PFPeA	60%		50-150%
	13C5-PFHxA	66%		50-150%
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	76%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	81%		50-150%
	13C7-PFUnDA	76%		40-140%
	13C2-PFDoDA	63%		40-140%
	13C2-PFTeDA	16% ^b		30-130%
	13C3-PFBS	62%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	40%		30-130%
	d3-MeFOSAA	94%		50-150%
	d5-EtFOSAA	87%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	93%		50-150%
	13C3-HFPO-DA	59%		50-150%

(a) Associated ID Standard outside control limits, Confirmed by batch QC.

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MICHAVE-MH-4_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-2	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9274.D	1	12/17/20 03:51	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9306.D	5	12/17/20 14:31	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0096	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0078	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0077	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0091	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0161	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0017	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0019	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0126	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MICHAVE-MH-4_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-2	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%	78%	35-135%
	13C5-PFPeA	61%	77%	50-150%
	13C5-PFHxA	66%	81%	50-150%
	13C4-PFHpA	71%	83%	50-150%
	13C8-PFOA	76%	86%	50-150%
	13C9-PFNA	82%	92%	50-150%
	13C6-PFDA	85%	94%	50-150%
	13C7-PFUnDA	82%	88%	40-140%
	13C2-PFDoDA	69%	82%	40-140%
	13C2-PFTeDA	29% ^b	61%	30-130%
	13C3-PFBS	62%	77%	50-150%
	13C3-PFHxS	74%	82%	50-150%
	13C8-PFOS	79%	81%	50-150%
	13C8-FOSA	44%	81%	30-130%
	d3-MeFOSAA	102%	105%	50-150%
	d5-EtFOSAA	98%	91%	50-150%
	13C2-4:2FTS	69%	86%	50-150%
	13C2-6:2FTS	87%	98%	50-150%
	13C2-8:2FTS	99%	101%	50-150%
	13C3-HFPO-DA	59%	77%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-5_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-3	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9275.D	1	12/17/20 04:06	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9307.D	5	12/17/20 14:46	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0209	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0685	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0510	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0315	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0439	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0034	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0015	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND ^a	0.010	0.0050	ug/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0122	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0167	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-5_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-3	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND ^a	0.040	0.010	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	78%	35-135%
	13C5-PFPeA	62%	76%	50-150%
	13C5-PFHxA	67%	80%	50-150%
	13C4-PFHpA	72%	82%	50-150%
	13C8-PFOA	76%	85%	50-150%
	13C9-PFNA	78%	89%	50-150%
	13C6-PFDA	72%	84%	50-150%
	13C7-PFUnDA	53%	76%	40-140%
	13C2-PFDoDA	25% ^c	58%	40-140%
	13C2-PFTeDA	5% ^c	18%	30-130%
	13C3-PFBS	62%	81%	50-150%
	13C3-PFHxS	74%	83%	50-150%
	13C8-PFOS	70%	81%	50-150%
	13C8-FOSA	41%	80%	30-130%
	d3-MeFOSAA	79%	87%	50-150%
	d5-EtFOSAA	68%	79%	50-150%
	13C2-4:2FTS	70%	85%	50-150%
	13C2-6:2FTS	86%	96%	50-150%
	13C2-8:2FTS	82%	87%	50-150%
	13C3-HFPO-DA	60%	70%	50-150%

(a) Result is from Run# 2

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-4_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-4	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9276.D	1	12/17/20 04:21	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9308.D	5	12/17/20 15:01	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0438	0.0042	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.183	0.0021	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.116	0.0021	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0457	0.0021	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0351	0.0021	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0029	0.0021	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0015	0.0021	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0021	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.010	0.0052	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.010	0.0052	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0055	0.0021	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0014	0.0021	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0021	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0169	0.0021	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0010	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0042	0.0021	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0042	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0042	0.0021	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: VERLINDEN-MH-4_120920**Lab Sample ID:** FA81615-4**Date Sampled:** 12/09/20**Matrix:** AQ - Water**Date Received:** 12/11/20**Method:** EPA 537M BY ID EPA 537 MOD**Percent Solids:** n/a**Project:** Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0042	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0083	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0083	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0083	0.0021	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%	74%	35-135%
	13C5-PFPeA	63%	78%	50-150%
	13C5-PFHxA	68%	80%	50-150%
	13C4-PFHpA	74%	82%	50-150%
	13C8-PFOA	76%	84%	50-150%
	13C9-PFNA	80%	87%	50-150%
	13C6-PFDA	79%	88%	50-150%
	13C7-PFUnDA	72%	78%	40-140%
	13C2-PFDoDA	56%	69%	40-140%
	13C2-PFTeDA	12% ^b	49%	30-130%
	13C3-PFBS	63%	79%	50-150%
	13C3-PFHxS	76%	81%	50-150%
	13C8-PFOS	75%	85%	50-150%
	13C8-FOSA	39%	73%	30-130%
	d3-MeFOSAA	89%	93%	50-150%
	d5-EtFOSAA	83%	85%	50-150%
	13C2-4:2FTS	72%	84%	50-150%
	13C2-6:2FTS	86%	93%	50-150%
	13C2-8:2FTS	92%	94%	50-150%
	13C3-HFPO-DA	62%	72%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-3_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-5	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9277.D	1	12/17/20 04:37	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0347	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.144	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0964	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0438	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0314	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0028	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0011	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0076	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0111	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-3_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-5	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%		35-135%
	13C5-PFPeA	64%		50-150%
	13C5-PFHxA	70%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	85%		40-140%
	13C2-PFTeDA	82%		30-130%
	13C3-PFBS	66%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	83%		50-150%
	13C8-FOSA	50%		30-130%
	d3-MeFOSAA	106%		50-150%
	d5-EtFOSAA	113%		50-150%
	13C2-4:2FTS	73%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	103%		50-150%
	13C3-HFPO-DA	63%		50-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-2_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-6	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9278.D	1	12/17/20 04:52	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9309.D	5	12/17/20 15:17	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0222	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0774	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.120	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0431	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0215	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0019	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0092	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-2_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-6	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%	77%	35-135%
	13C5-PFPeA	63%	79%	50-150%
	13C5-PFHxA	68%	82%	50-150%
	13C4-PFHpA	74%	86%	50-150%
	13C8-PFOA	77%	87%	50-150%
	13C9-PFNA	84%	94%	50-150%
	13C6-PFDA	84%	94%	50-150%
	13C7-PFUnDA	79%	90%	40-140%
	13C2-PFDoDA	56%	81%	40-140%
	13C2-PFTeDA	12% ^b	42%	30-130%
	13C3-PFBS	64%	81%	50-150%
	13C3-PFHxS	77%	86%	50-150%
	13C8-PFOS	80%	89%	50-150%
	13C8-FOSA	39%	81%	30-130%
	d3-MeFOSAA	100%	107%	50-150%
	d5-EtFOSAA	99%	96%	50-150%
	13C2-4:2FTS	73%	86%	50-150%
	13C2-6:2FTS	87%	99%	50-150%
	13C2-8:2FTS	98%	100%	50-150%
	13C3-HFPO-DA	61%	75%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-1_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-7	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9279.D	1	12/17/20 05:08	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0177	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0340	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0316	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0217	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0405	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0024	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0040	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0021	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0038	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0081	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VERLINDEN-MH-1_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-7	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	56%		35-135%
	13C5-PFPeA	58%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	84%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	92%		40-140%
	13C2-PFDoDA	89%		40-140%
	13C2-PFTeDA	91%		30-130%
	13C3-PFBS	62%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	81%		50-150%
	13C8-FOSA	49%		30-130%
	d3-MeFOSAA	104%		50-150%
	d5-EtFOSAA	107%		50-150%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	104%		50-150%
	13C3-HFPO-DA	60%		50-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	OSBORN-MH-1_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-8	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9280.D	1	12/17/20 05:23	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9310.D	5	12/17/20 15:32	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0203	0.0042	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0247	0.0021	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0221	0.0021	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0182	0.0021	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0397	0.0021	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0058	0.0021	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0047	0.0021	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND ^a	0.010	0.0052	ug/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND ^a	0.010	0.0052	ug/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND ^a	0.010	0.0052	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0021	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0021	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0240	0.0021	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0042	0.0021	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0042	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0042	0.0021	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	OSBORN-MH-1_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-8	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0042	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0083	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0083	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND ^a	0.042	0.010	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	54%	74%	35-135%
	13C5-PFPeA	62%	79%	50-150%
	13C5-PFHxA	67%	83%	50-150%
	13C4-PFHpA	71%	84%	50-150%
	13C8-PFOA	74%	87%	50-150%
	13C9-PFNA	77%	91%	50-150%
	13C6-PFDA	74%	89%	50-150%
	13C7-PFUnDA	57%	80%	40-140%
	13C2-PFDoDA	25% ^c	59%	40-140%
	13C2-PFTeDA	8% ^c	17%	30-130%
	13C3-PFBS	64%	79%	50-150%
	13C3-PFHxS	76%	82%	50-150%
	13C8-PFOS	72%	81%	50-150%
	13C8-FOSA	30%	60%	30-130%
	d3-MeFOSAA	72%	114%	50-150%
	d5-EtFOSAA	70%	107%	50-150%
	13C2-4:2FTS	71%	87%	50-150%
	13C2-6:2FTS	84%	101%	50-150%
	13C2-8:2FTS	88%	101%	50-150%
	13C3-HFPO-DA	61%	75%	50-150%

(a) Result is from Run# 2

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-9	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9281.D	1	12/17/20 05:39	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9311.D	5	12/17/20 15:48	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0357	0.0042	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.155	0.0021	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.102	0.0021	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0454	0.0021	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0321	0.0021	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0026	0.0021	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0021	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0021	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid ^a	ND ^b	0.010	0.0052	ug/l	
376-06-7	Perfluorotetradecanoic acid ^a	ND ^b	0.010	0.0052	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0071	0.0021	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0035	0.0021	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0113	0.0021	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0010	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0042	0.0021	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0042	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0042	0.0021	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-9	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0042	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0083	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0083	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0083	0.0021	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	54%	70%	35-135%
	13C5-PFPeA	59%	72%	50-150%
	13C5-PFHxA	64%	75%	50-150%
	13C4-PFHpA	68%	77%	50-150%
	13C8-PFOA	71%	78%	50-150%
	13C9-PFNA	74%	84%	50-150%
	13C6-PFDA	74%	83%	50-150%
	13C7-PFUnDA	67%	77%	40-140%
	13C2-PFDoDA	48%	67%	40-140%
	13C2-PFTeDA	6% ^c	20% ^c	30-130%
	13C3-PFBS	59%	71%	50-150%
	13C3-PFHxS	70%	78%	50-150%
	13C8-PFOS	69%	76%	50-150%
	13C8-FOSA	36%	72%	30-130%
	d3-MeFOSAA	86%	93%	50-150%
	d5-EtFOSAA	81%	86%	50-150%
	13C2-4:2FTS	67%	79%	50-150%
	13C2-6:2FTS	80%	89%	50-150%
	13C2-8:2FTS	85%	88%	50-150%
	13C3-HFPO-DA	58%	69%	50-150%

(a) Associated ID Standard outside control limits, Confirmed by re-analysis.

(b) Result is from Run# 2

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-MH-19_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-10	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9284.D	1	12/17/20 06:25	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9312.D	5	12/17/20 16:03	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	220 ml	1.0 ml
Run #2	220 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0391	0.0045	0.0023	ug/l	
2706-90-3	Perfluoropentanoic acid	0.135	0.0023	0.0011	ug/l	
307-24-4	Perfluorohexanoic acid	0.112	0.0023	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0608	0.0023	0.0011	ug/l	
335-67-1	Perfluorooctanoic acid	0.0871	0.0023	0.0011	ug/l	
375-95-1	Perfluorononanoic acid	0.0056	0.0023	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080	0.0023	0.0011	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0016	0.0023	0.0011	ug/l	J
307-55-1	Perfluorododecanoic acid	0.0015	0.0023	0.0011	ug/l	J
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.011	0.0057	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.011	0.0057	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0023	0.0011	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0038	0.0023	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0023	0.0011	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0023	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0116	0.0023	0.0011	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0023	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0023	0.0011	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0045	0.0023	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0045	0.0023	ug/l	
2991-50-6	EtFOSAA	ND	0.0045	0.0023	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P6-MH-19_120920**Lab Sample ID:** FA81615-10**Date Sampled:** 12/09/20**Matrix:** AQ - Water**Date Received:** 12/11/20**Method:** EPA 537M BY ID EPA 537 MOD**Percent Solids:** n/a**Project:** Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0045	0.0023	ug/l	
919005-14-4	ADONA	ND	0.0091	0.0023	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0091	0.0023	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0091	0.0023	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%	73%	35-135%
	13C5-PFPeA	61%	74%	50-150%
	13C5-PFHxA	66%	76%	50-150%
	13C4-PFHpA	71%	79%	50-150%
	13C8-PFOA	73%	81%	50-150%
	13C9-PFNA	79%	85%	50-150%
	13C6-PFDA	81%	86%	50-150%
	13C7-PFUnDA	77%	83%	40-140%
	13C2-PFDoDA	67%	76%	40-140%
	13C2-PFTeDA	28% ^b	49%	30-130%
	13C3-PFBS	60%	78%	50-150%
	13C3-PFHxS	72%	78%	50-150%
	13C8-PFOS	73%	77%	50-150%
	13C8-FOSA	45%	73%	30-130%
	d3-MeFOSAA	94%	93%	50-150%
	d5-EtFOSAA	86%	85%	50-150%
	13C2-4:2FTS	70%	80%	50-150%
	13C2-6:2FTS	82%	91%	50-150%
	13C2-8:2FTS	90%	90%	50-150%
	13C3-HFPO-DA	59%	69%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-MH-18_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-11	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9285.D	1	12/17/20 06:40	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9313.D	5	12/17/20 16:19	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0171	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0264	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0306	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0225	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0619	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0058	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0014	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0139	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P6-MH-18_120920

Lab Sample ID: FA81615-11

Date Sampled: 12/09/20

Matrix: AQ - Water

Date Received: 12/11/20

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	54%	69%	35-135%
	13C5-PFPeA	59%	72%	50-150%
	13C5-PFHxA	63%	74%	50-150%
	13C4-PFHpA	68%	77%	50-150%
	13C8-PFOA	71%	79%	50-150%
	13C9-PFNA	75%	85%	50-150%
	13C6-PFDA	76%	85%	50-150%
	13C7-PFUnDA	73%	80%	40-140%
	13C2-PFDoDA	62%	75%	40-140%
	13C2-PFTeDA	27% ^b	49%	30-130%
	13C3-PFBS	58%	73%	50-150%
	13C3-PFHxS	70%	77%	50-150%
	13C8-PFOS	72%	79%	50-150%
	13C8-FOSA	38%	72%	30-130%
	d3-MeFOSAA	93%	95%	50-150%
	d5-EtFOSAA	89%	84%	50-150%
	13C2-4:2FTS	67%	80%	50-150%
	13C2-6:2FTS	79%	88%	50-150%
	13C2-8:2FTS	88%	89%	50-150%
	13C3-HFPO-DA	59%	70%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-MH-17_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-12	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9286.D	1	12/17/20 06:56	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0312	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0551	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0544	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0595	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.120	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0157	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0095	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0039	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0023	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0291	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P6-MH-17_120920

Lab Sample ID: FA81615-12

Date Sampled: 12/09/20

Matrix: AQ - Water

Date Received: 12/11/20

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%		35-135%
	13C5-PFPeA	62%		50-150%
	13C5-PFHxA	68%		50-150%
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	75%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	75%		40-140%
	13C2-PFDoDA	65%		40-140%
	13C2-PFTeDA	38%		30-130%
	13C3-PFBS	61%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	46%		30-130%
	d3-MeFOSAA	95%		50-150%
	d5-EtFOSAA	89%		50-150%
	13C2-4:2FTS	71%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	89%		50-150%
	13C3-HFPO-DA	61%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-MH-16_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-13	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9287.D	1	12/17/20 07:11	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9314.D	5	12/17/20 16:34	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0220	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0263	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0293	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0203	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0459	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0017	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND ^a	0.010	0.0050	ug/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0015	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0186	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0022	0.0020	0.0010	ug/l	

PERFLUOROOCETANESULFONAMIDES

754-91-6	PFOSA	ND ^a	0.020	0.010	ug/l	

PERFLUOROOCETANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-MH-16_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-13	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND ^a	0.040	0.010	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	66%	35-135%
	13C5-PFPeA	59%	73%	50-150%
	13C5-PFHxA	64%	75%	50-150%
	13C4-PFHpA	68%	80%	50-150%
	13C8-PFOA	71%	80%	50-150%
	13C9-PFNA	73%	85%	50-150%
	13C6-PFDA	68%	82%	50-150%
	13C7-PFUnDA	53%	73%	40-140%
	13C2-PFDoDA	25% ^c	57%	40-140%
	13C2-PFTeDA	5% ^c	14% ^c	30-130%
	13C3-PFBS	60%	73%	50-150%
	13C3-PFHxS	71%	78%	50-150%
	13C8-PFOS	64%	78%	50-150%
	13C8-FOSA	26% ^c	62%	30-130%
	d3-MeFOSAA	77%	91%	50-150%
	d5-EtFOSAA	72%	82%	50-150%
	13C2-4:2FTS	67%	81%	50-150%
	13C2-6:2FTS	79%	91%	50-150%
	13C2-8:2FTS	80%	86%	50-150%
	13C3-HFPO-DA	58%	71%	50-150%

(a) Result is from Run# 2

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P3-MH-290_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-14	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9288.D	1	12/17/20 07:27	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9315.D	5	12/17/20 16:49	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0029	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0020	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P3-MH-290_120920

Lab Sample ID: FA81615-14

Date Sampled: 12/09/20

Matrix: AQ - Water

Date Received: 12/11/20

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%	82%	35-135%
	13C5-PFPeA	61%	78%	50-150%
	13C5-PFHxA	66%	79%	50-150%
	13C4-PFHpA	70%	85%	50-150%
	13C8-PFOA	74%	87%	50-150%
	13C9-PFNA	78%	92%	50-150%
	13C6-PFDA	80%	96%	50-150%
	13C7-PFUnDA	78%	91%	40-140%
	13C2-PFDoDA	62%	82%	40-140%
	13C2-PFTeDA	18% ^b	44%	30-130%
	13C3-PFBS	62%	79%	50-150%
	13C3-PFHxS	73%	86%	50-150%
	13C8-PFOS	73%	89%	50-150%
	13C8-FOSA	46%	92%	30-130%
	d3-MeFOSAA	103%	109%	50-150%
	d5-EtFOSAA	104%	101%	50-150%
	13C2-4:2FTS	69%	83%	50-150%
	13C2-6:2FTS	84%	99%	50-150%
	13C2-8:2FTS	94%	99%	50-150%
	13C3-HFPO-DA	59%	76%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P3-MH-297_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-15	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9289.D	1	12/17/20 07:42	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0024	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCETANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCETANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P3-MH-297_120920

Lab Sample ID: FA81615-15

Date Sampled: 12/09/20

Matrix: AQ - Water

Date Received: 12/11/20

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%		35-135%
	13C5-PFPeA	59%		50-150%
	13C5-PFHxA	63%		50-150%
	13C4-PFHpA	68%		50-150%
	13C8-PFOA	73%		50-150%
	13C9-PFNA	75%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	71%		40-140%
	13C2-PFDoDA	67%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	60%		50-150%
	13C3-PFHxS	68%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	62%		30-130%
	d3-MeFOSAA	84%		50-150%
	d5-EtFOSAA	78%		50-150%
	13C2-4:2FTS	66%		50-150%
	13C2-6:2FTS	81%		50-150%
	13C2-8:2FTS	82%		50-150%
	13C3-HFPO-DA	57%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P3-MH-284_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-16	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9290.D	1	12/17/20 07:58	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0030	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0010	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P3-MH-284_120920

Lab Sample ID: FA81615-16

Date Sampled: 12/09/20

Matrix: AQ - Water

Date Received: 12/11/20

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%		35-135%
	13C5-PFPeA	57%		50-150%
	13C5-PFHxA	61%		50-150%
	13C4-PFHpA	65%		50-150%
	13C8-PFOA	69%		50-150%
	13C9-PFNA	74%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	67%		40-140%
	13C2-PFTeDA	45%		30-130%
	13C3-PFBS	58%		50-150%
	13C3-PFHxS	68%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	46%		30-130%
	d3-MeFOSAA	96%		50-150%
	d5-EtFOSAA	92%		50-150%
	13C2-4:2FTS	64%		50-150%
	13C2-6:2FTS	76%		50-150%
	13C2-8:2FTS	88%		50-150%
	13C3-HFPO-DA	56%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-02_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-17	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q60365.D	1	12/23/20 22:37	NAF	12/22/20 08:30	OP83473	S2Q883
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0027	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-02_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-17	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	63%		50-150%
	13C4-PFHpA	58%		50-150%
	13C8-PFOA	63%		50-150%
	13C9-PFNA	67%		50-150%
	13C6-PFDA	74%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	74%		40-140%
	13C2-PFTeDA	75%		30-130%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	63%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	40%		30-130%
	d3-MeFOSAA	104%		50-150%
	d5-EtFOSAA	100%		50-150%
	13C2-4:2FTS	63%		50-150%
	13C2-6:2FTS	69%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	72%		50-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-2_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-18	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9292.D	1	12/17/20 08:29	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9319.D	5	12/17/20 17:51	MV	12/15/20 08:00	OP83388	S4Q128

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0066	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0041	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0038	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0031	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0069	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.010	0.0050	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0105	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0028	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0101	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND ^a	0.020	0.010	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-2_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-18	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	69%	35-135%
	13C5-PFPeA	54%	69%	50-150%
	13C5-PFHxA	58%	72%	50-150%
	13C4-PFHpA	64%	75%	50-150%
	13C8-PFOA	68%	78%	50-150%
	13C9-PFNA	73%	84%	50-150%
	13C6-PFDA	74%	85%	50-150%
	13C7-PFUnDA	68%	79%	40-140%
	13C2-PFDoDA	48%	69%	40-140%
	13C2-PFTeDA	10% ^b	34%	30-130%
	13C3-PFBS	55%	67%	50-150%
	13C3-PFHxS	66%	74%	50-150%
	13C8-PFOS	70%	78%	50-150%
	13C8-FOSA	25% ^b	52%	30-130%
	d3-MeFOSAA	83%	98%	50-150%
	d5-EtFOSAA	79%	88%	50-150%
	13C2-4:2FTS	62%	78%	50-150%
	13C2-6:2FTS	78%	88%	50-150%
	13C2-8:2FTS	88%	90%	50-150%
	13C3-HFPO-DA	54%	64%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-30_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-19	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q60366.D	1	12/23/20 22:51	NAF	12/22/20 08:30	OP83473	S2Q883
Run #2							

Run #	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0080	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0024	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0066	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0019	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.106	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0029	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0103	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0059	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0847	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA ^a	ND	0.0037	0.0019	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

NEXT GENERATION PFAS ANALYTES

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-30_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-19	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
13252-13-6	HFPO-DA (GenX)	ND	0.0037	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%		35-135%
	13C5-PFPeA	50%		50-150%
	13C5-PFHxA	47% ^b		50-150%
	13C4-PFHpA	46% ^b		50-150%
	13C8-PFOA	54%		50-150%
	13C9-PFNA	59%		50-150%
	13C6-PFDA	68%		50-150%
	13C7-PFUnDA	66%		40-140%
	13C2-PFDoDA	67%		40-140%
	13C2-PFTeDA	54%		30-130%
	13C3-PFBS	55%		50-150%
	13C3-PFHxS	53%		50-150%
	13C8-PFOS	69%		50-150%
	13C8-FOSA	20% ^b		30-130%
	d3-MeFOSAA	89%		50-150%
	d5-EtFOSAA	96%		50-150%
	13C2-4:2FTS	47% ^b		50-150%
	13C2-6:2FTS	59%		50-150%
	13C2-8:2FTS	75%		50-150%
	13C3-HFPO-DA	57%		50-150%

(a) Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-CB-32_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-20	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9225.D	1	12/16/20 15:14	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0119	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0017	0.0019	0.00096	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0011	0.0019	0.00096	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.0011	0.0019	0.00096	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00096	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00096	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0019	0.00096	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0032	0.0019	0.00096	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00096	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0038	0.0019	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0038	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0038	0.0019	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-CB-32_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-20	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0038	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	75%		50-150%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	83%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	33%		30-130%
	13C3-PFBS	76%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	62%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	91%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	99%		50-150%
	13C3-HFPO-DA	70%		50-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-26_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-21	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9296.D	1	12/17/20 09:38	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0067	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0056	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0054	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0049	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0103	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0067	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P2-MH-26_121020**Lab Sample ID:** FA81615-21**Date Sampled:** 12/10/20**Matrix:** AQ - Water**Date Received:** 12/11/20**Method:** EPA 537M BY ID EPA 537 MOD**Percent Solids:** n/a**Project:** Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%		35-135%
	13C5-PFPeA	62%		50-150%
	13C5-PFHxA	66%		50-150%
	13C4-PFHpA	70%		50-150%
	13C8-PFOA	73%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	74%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	55%		30-130%
	13C3-PFBS	61%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	39%		30-130%
	d3-MeFOSAA	91%		50-150%
	d5-EtFOSAA	94%		50-150%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	83%		50-150%
	13C2-8:2FTS	91%		50-150%
	13C3-HFPO-DA	62%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-01_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-22	Date Received:	12/11/20
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9228.D	1	12/16/20 16:01	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-01_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-22	Date Received:	12/11/20
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	82%		50-150%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	84%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	88%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	86%		40-140%
	13C2-PFTeDA	82%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	93%		30-130%
	d3-MeFOSAA	89%		50-150%
	d5-EtFOSAA	83%		50-150%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	92%		50-150%
	13C3-HFPO-DA	75%		50-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-23	Date Received:	12/11/20
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9229.D	1	12/16/20 16:16	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-23	Date Received:	12/11/20
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	84%		35-135%
	13C5-PFPeA	88%		50-150%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	90%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	93%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	80%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	98%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	86%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	96%		50-150%
	13C3-HFPO-DA	81%		50-150%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-NW_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-24	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9230.D	1	12/16/20 16:32	MV	12/14/20 13:00	OP83375	S4Q127
Run #2	4Q9196.D	10	12/15/20 22:52	MV	12/14/20 13:00	OP83375	S4Q126

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0060	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0038	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0036	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0027	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0059	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.020	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.020	0.010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0018	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0090	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0021	0.0080	0.0020	ug/l	J

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-NW_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-24	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%	81%	35-135%
	13C5-PFPeA	62%	82%	50-150%
	13C5-PFHxA	67%	85%	50-150%
	13C4-PFHpA	72%	87%	50-150%
	13C8-PFOA	75%	86%	50-150%
	13C9-PFNA	78%	94%	50-150%
	13C6-PFDA	75%	91%	50-150%
	13C7-PFUnDA	68%	86%	40-140%
	13C2-PFDoDA	54%	76%	40-140%
	13C2-PFTeDA	20% ^b	50%	30-130%
	13C3-PFBS	62%	83%	50-150%
	13C3-PFHxS	75%	85%	50-150%
	13C8-PFOS	72%	88%	50-150%
	13C8-FOSA	38%	97%	30-130%
	d3-MeFOSAA	79%	104%	50-150%
	d5-EtFOSAA	75%	77%	50-150%
	13C2-4:2FTS	71%	87%	50-150%
	13C2-6:2FTS	84%	107%	50-150%
	13C2-8:2FTS	86%	97%	50-150%
	13C3-HFPO-DA	62%	90%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-14_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-25	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9231.D	1	12/16/20 16:47	MV	12/14/20 13:00	OP83375	S4Q127
Run #2	4Q9197.D	10	12/15/20 23:08	MV	12/14/20 13:00	OP83375	S4Q126

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0178	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0244	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0184	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0162	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0308	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0011	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.020	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.020	0.010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0034	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0025	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0150	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0788	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND ^a	0.040	0.020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0033	0.0080	0.0020	ug/l	J

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P2-MH-14_121020

Lab Sample ID: FA81615-25

Date Sampled: 12/10/20

Matrix: AQ - Water

Date Received: 12/11/20

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	83%	35-135%
	13C5-PFPeA	67%	85%	50-150%
	13C5-PFHxA	73%	88%	50-150%
	13C4-PFHpA	77%	87%	50-150%
	13C8-PFOA	79%	87%	50-150%
	13C9-PFNA	81%	93%	50-150%
	13C6-PFDA	76%	83%	50-150%
	13C7-PFUnDA	63%	74%	40-140%
	13C2-PFDoDA	40%	59%	40-140%
	13C2-PFTeDA	4% ^b	32%	30-130%
	13C3-PFBS	65%	85%	50-150%
	13C3-PFHxS	79%	89%	50-150%
	13C8-PFOS	77%	87%	50-150%
	13C8-FOSA	28% ^b	67%	30-130%
	d3-MeFOSAA	75%	95%	50-150%
	d5-EtFOSAA	70%	71%	50-150%
	13C2-4:2FTS	76%	92%	50-150%
	13C2-6:2FTS	89%	106%	50-150%
	13C2-8:2FTS	88%	88%	50-150%
	13C3-HFPO-DA	67%	93%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-25_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-26	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9232.D	1	12/16/20 17:02	MV	12/14/20 13:00	OP83375	S4Q127
Run #2	4Q9198.D	10	12/15/20 23:23	MV	12/14/20 13:00	OP83375	S4Q126

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0083	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0073	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0069	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0065	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0132	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	0.020	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	0.020	0.010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0018	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0073	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND ^a	0.040	0.020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P2-MH-25_121020**Lab Sample ID:** FA81615-26**Date Sampled:** 12/10/20**Matrix:** AQ - Water**Date Received:** 12/11/20**Method:** EPA 537M BY ID EPA 537 MOD**Percent Solids:** n/a**Project:** Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%	84%	35-135%
	13C5-PFPeA	65%	83%	50-150%
	13C5-PFHxA	69%	86%	50-150%
	13C4-PFHpA	74%	88%	50-150%
	13C8-PFOA	76%	86%	50-150%
	13C9-PFNA	79%	91%	50-150%
	13C6-PFDA	76%	88%	50-150%
	13C7-PFUnDA	68%	85%	40-140%
	13C2-PFDoDA	51%	73%	40-140%
	13C2-PFTeDA	14% ^b	52%	30-130%
	13C3-PFBS	63%	82%	50-150%
	13C3-PFHxS	78%	84%	50-150%
	13C8-PFOS	75%	80%	50-150%
	13C8-FOSA	29% ^b	81%	30-130%
	d3-MeFOSAA	74%	105%	50-150%
	d5-EtFOSAA	72%	84%	50-150%
	13C2-4:2FTS	72%	88%	50-150%
	13C2-6:2FTS	86%	108%	50-150%
	13C2-8:2FTS	89%	95%	50-150%
	13C3-HFPO-DA	64%	90%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-W_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-27	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9233.D	1	12/16/20 17:18	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0031	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0012	0.0020	0.0010	ug/l	J
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0025	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0026	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: P2-MH-W_121020**Lab Sample ID:** FA81615-27**Date Sampled:** 12/10/20**Matrix:** AQ - Water**Date Received:** 12/11/20**Method:** EPA 537M BY ID EPA 537 MOD**Percent Solids:** n/a**Project:** Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	67%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	80%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	86%		30-130%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	91%		50-150%
	d5-EtFOSAA	83%		50-150%
	13C2-4:2FTS	76%		50-150%
	13C2-6:2FTS	92%		50-150%
	13C2-8:2FTS	95%		50-150%
	13C3-HFPO-DA	66%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-03_121020		
Lab Sample ID:	FA81615-28	Date Sampled:	12/10/20
Matrix:	AQ - Water	Date Received:	12/11/20
Method:	EPA 537M BY ID EPA 537 MOD	Percent Solids:	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9234.D	1	12/16/20 17:33	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0083	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0074	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0068	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0063	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0140	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0016	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0012	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0077	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: DUP-03_121020**Lab Sample ID:** FA81615-28**Date Sampled:** 12/10/20**Matrix:** AQ - Water**Date Received:** 12/11/20**Method:** EPA 537M BY ID EPA 537 MOD**Percent Solids:** n/a**Project:** Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%		35-135%
	13C5-PFPeA	61%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	72%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	81%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	77%		30-130%
	13C3-PFBS	60%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	42%		30-130%
	d3-MeFOSAA	82%		50-150%
	d5-EtFOSAA	86%		50-150%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	80%		50-150%
	13C2-8:2FTS	93%		50-150%
	13C3-HFPO-DA	60%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Page 1 of 1

Job Number: FA81615

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014





SGS North America Inc - Orlando
Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811
TEL: 407-425-6700 FAX: 407-425-0707
www.sgs.com

FA81615

SGS - ORLANDO JOB #:

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SGS - ORLANDO Quote # SKIFF #

Client / Reporting Information			Project Information			Analytical Information													Matrix Codes
Company Name: Arcadis			Project Name: RACER Lansing PFAS Delamination																DW - Drinking Water
Address: 28550 Cabot Dr. Ste 500			Street																GW - Ground Water
City: Novi State: MI Zip: 48377			City: Lansing State: MI																WW - Water
Project Contact: Marina Samp Email: Marina.Samp@arcadis.com			Project # 30042872.03600																SW - Surface Water
Phone #: 248-994-2318			Fax #																SO - Soil
Sampler(s) Name(s) (Printed)			Client Purchase Order # 30042872.03600																SL - Sludge
Sampler 1: A. Marchich Sampler 2: E. Wilkespoon																			OL - Oil
SGS Orlando Sample #			COLLECTION			CONTAINER INFORMATION													LIQ - Other Liquid
Field ID / Point of Collection			DATE	TIME	SAMPLED BY	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNOS	H2SO4	NaOH/2Na	DI WATER	MEDH	LAB USE ONLY		
10	P6-MH-19-120920	12/4/20	1239	AM	WW	2	X												
11	P6-MH-18-120920	12/4/20	1305	AM	WW	2	X												
12	P6-MH-17-120920	12/4/20	1324	AM	WW	2	X												
13	P6-MH-16-120920	12/4/20	1350	AM	WW	2	X												
14	P3-MH-297-120920	12/4/20	1515	AM	WW	2	X												
15	P3-MH-290-120920	12/4/20	1515	AM	WW	2	X												
16	P3-MH-297-120920	12/4/20	1455	AM	WW	2	X												
17	P3-MH-284-120920	12/4/20	1535	AM	WW	2	X												
18	DWP-02-120920	12/4/20		AM	WW	2	X												
19	P2-MH-2-121020	12/10/20	0905	AM	WW	2	X												
20	P2-MH-30-121020	12/10/20	0920	AM	WW	2	X												
Turnaround Time (Business days)			Data Deliverable Information			Comments / Remarks													
10 Day (Business) Approved By: / Date:			☐ COMMERCIAL "A" (RESULTS ONLY)			Email results to Andrew Lorenz andrew.lorenz@arcadis.com													
7 Day			☒ COMMERCIAL "B" (RESULTS PLUS QC)			WW = Waste Water													
5 Day			☐ REDT1 (EPA LEVEL 3)																
3 Day RUSH			☐ FULLT1 (EPA LEVEL 4)																
2 Day RUSH			☒ EDD'S																
1 Day RUSH																			
Other																			
Rush T/A Data Available VIA Email or Lablink			Sample Custody must be documented below each time samples change possession, including courier delivery.																
Relinquished by/Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation		
1. Andrew Marchich	12/10/20 1600	2. FedEx	3. Px	12/11/20 1000	4. Carlos Delgado	5.		6.	7.		8.								
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation		
5.		6.	7.		8.														
Lab Use Only: Cooler Temperature (s) Celsius (corrected): 24																			

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http://www.sgs.com/en/terms-and-conditions

FA81615: Chain of Custody

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SGS North America Inc - Orlando
Chain of Custody

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FA 81615

SGS - ORLANDO JOB #:

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Client / Reporting Information				Project Information				Analytical Information												Matrix Codes														
Company Name: Arcadis				Project Name: KACEK Lansing PPARS Delineation				EPA 81615 (List of 25)												DW - Drinking Water GW - Ground Water SW - Surface Water WW - Wastewater SL - Sludge OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid														
Address: 28550 Cabot Dr. Ste 500				Street																														
City: Novi State: MI Zip: 48377				City: Lansing State: MI																														
Project Contact: Marina Samp Email: marina.samp@arcadis.com				Project # 30042872.03600																														
Phone #: 248-994-7318				Fax #																														
Sampler(s) Name(s) (Printed)				Client Purchase Order # 30042872.03600																														
Sampler 1: A. Marchetti Sampler 2: E. Wilber				COLLECTION				CONTAINER INFORMATION																										
SGS Orlando Sample #	Field ID / Point of Collection	DATE	TIME	SAMPLED BY	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	IC	NOH	INC3	INC4	INC5	INC6	INC7	INC8	INC9	INC10	INC11	INC12	INC13	INC14	INC15	INC16	INC17	INC18	INC19	INC20	INC21	INC22	INC23	INC24	INC25	LAB USE ONLY
20	P2-CB-32-121020	12/10/20	1150 AM	WW	6			X																										
21	P2-MH-26-121020	12/10/20	1210 AM	NW	2			X																										
22	FB-01-121020	12/10/20	1215 AM	NW	2			X																										
23	EB-01-121020	12/10/20	1220 AM	WW	8			X																										
24	P2-MH-NW-121020	12/10/20	0943 AM	WW	2			X																										
25	P2-MH-14-121020	12/10/20	1005 AM	WW	2			X																										
26	P2-MH-25-121020	12/10/20	1055 AM	WW	2			X																										
27	P2-MH-W-121020	12/10/20	1125 AM	WW	2			X																										
28	DUP-03-121020	12/10/20		AM	WW	2		X																										
Turnaround Time (Business days)				Data Deliverable Information				Comments / Remarks																										
10 Day (Business) Approved By: / Date:				☐ COMMERCIAL "A" (RESULTS ONLY)				P2-CB-32-121020 is a MS/MSD																										
7 Day				☒ COMMERCIAL "B" (RESULTS PLUS QC)				Email results to Andrew Lorenz andrew.lorenz@arcadis.com																										
5 Day				☐ REDT1 (EPA LEVEL 3)				WW = Waste Water																										
3 Day RUSH				☐ FULLT1 (EPA LEVEL 4)																														
2 Day RUSH				☒ EDD'S																														
1 Day RUSH																																		
Other																																		
Rush T/A Data Available VIA Email or Lablink				Sample Custody must be documented below each time samples change possession, including courier delivery.																														
Relinquished by Sampler/Affiliation		Date Time:		Received By/Affiliation		Date Time:		Relinquished By/Affiliation		Date Time:		Received By/Affiliation																						
1. A. Marchetti		12/10/20 1600		2. FedEx		12/11/20 1000		3. FX		12/11/20 1000		4. Carter H. DeGroot																						
5.				6.				7.				8.																						
Lab Use Only: Cooler Temperature (s) Celsius (corrected): 8.4												http://www.sgs.com/en/terms-and-conditions																						

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FA81615: Chain of Custody

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SGS Sample Receipt Summary

Job Number: FA81615

Client: ARCADIS

Project: RACER LANSING PFAS DELINEATION

Date / Time Received: 12/11/2020 10:00:00 AM

Delivery Method: FED EX

Airbill #s: 923153824608

Therm ID: IR 1;

Therm CF: 0.2;

of Coolers: 3

Cooler Temps (Raw Measured) °C: Cooler 1: (0.2); Cooler 2: (2.2); Cooler 3: (1.6);

Cooler Temps (Corrected) °C: Cooler 1: (0.4); Cooler 2: (2.4); Cooler 3: (1.8);

Cooler Information

Y or N

1. Custody Seals Present	☒	☐
2. Custody Seals Intact	☒	☐
3. Temp criteria achieved	☒	☐
4. Cooler temp verification	<u>IR Gun</u>	
5. Cooler media	<u>Ice (Bag)</u>	

Trip Blank Information

Y or N N/A

1. Trip Blank present / cooler	☐	☐	☒
2. Trip Blank listed on COC	☐	☐	☒
	<u>W or S</u>	<u>N/A</u>	
3. Type Of TB Received	☐	☐	☒

Sample Information

Y or N N/A

1. Sample labels present on bottles	☒	☐	
2. Samples preserved properly	☒	☐	
3. Sufficient volume/containers recvd for analysis:	☒	☐	
4. Condition of sample	<u>Intact</u>		
5. Sample recvd within HT	☒	☐	
6. Dates/Times/IDs on COC match Sample Label	☒	☐	
7. VOCs have headspace	☐	☐	☒
8. Bottles received for unspecified tests	☐	☒	
9. Compositing instructions clear	☐	☐	☒
10. Voa Soil Kits/Jars received past 48hrs?	☐	☐	☒
11. % Solids Jar received?	☐	☐	☒
12. Residual Chlorine Present?	☐	☐	☒

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____
 Test Strip Lot #s: pH 0-3 _____ 230315 _____
 Residual Chlorine Test Strip Lot #: _____

Number of 5035 Field Kits: _____
 pH 10-12 _____ 219813A _____

Number of Lab Filtered Metals: _____
 Other: (Specify) _____

Comments

SM001
Rev. Date 05/24/17

Technician: CARLOSD

Date: 12/11/2020 10:00:00

Reviewer: _____

Date: _____

FA81615: Chain of Custody

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MS Semi-volatiles

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QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Instrument Blank

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q127-IBLK	4Q9222.D	1	12/16/20	MV	n/a	n/a	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-20, FA81615-21, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	92% 50-150%
	13C9-PFNA	96% 50-150%
	13C8-PFOS	90% 50-150%

Instrument Blank

Page 1 of 1

Job Number: FA81615

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q128-IBLK	4Q9303.D	1	12/17/20	MV	n/a	n/a	S4Q128

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-2, FA81615-3, FA81615-4, FA81615-6, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-13, FA81615-14, FA81615-18

CAS No.	Compound	Result	RL	MDL	Units	Q
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
763051-92-911Cl-PF3OUdS (F-53B Minor)		ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	96% 50-150%
	13C9-PFNA	101% 50-150%
	13C8-PFOS	96% 50-150%

Method Blank Summary

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MB	4Q9179.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	82% 35-135%
	13C5-PFPeA	89% 50-150%
	13C5-PFHxA	89% 50-150%
	13C4-PFHpA	92% 50-150%

Method Blank Summary

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MB	4Q9179.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples: Method: EPA 537M BY ID
FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	89% 50-150%
	13C9-PFNA	93% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	92% 40-140%
	13C2-PFDoDA	86% 40-140%
	13C2-PFTeDA	84% 30-130%
	13C3-PFBS	90% 50-150%
	13C3-PFHxS	89% 50-150%
	13C8-PFOS	86% 50-150%
	13C8-FOSA	106% 30-130%
	d3-MeFOSAA	90% 50-150%
	d5-EtFOSAA	84% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	96% 50-150%
	13C2-8:2FTS	96% 50-150%
	13C3-HFPO-DA	82% 50-150%

Method Blank Summary

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MB	4Q9268.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	79% 35-135%
	13C5-PFPeA	85% 50-150%
	13C5-PFHxA	85% 50-150%
	13C4-PFHpA	86% 50-150%

Method Blank Summary

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MB	4Q9268.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	86% 50-150%
	13C9-PFNA	89% 50-150%
	13C6-PFDA	88% 50-150%
	13C7-PFUnDA	85% 40-140%
	13C2-PFDoDA	83% 40-140%
	13C2-PFTeDA	85% 30-130%
	13C3-PFBS	84% 50-150%
	13C3-PFHxS	85% 50-150%
	13C8-PFOS	85% 50-150%
	13C8-FOSA	105% 30-130%
	d3-MeFOSAA	92% 50-150%
	d5-EtFOSAA	90% 50-150%
	13C2-4:2FTS	86% 50-150%
	13C2-6:2FTS	90% 50-150%
	13C2-8:2FTS	91% 50-150%
	13C3-HFPO-DA	76% 50-150%

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MB	2Q60362.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0037	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	85% 35-135%
	13C5-PFPeA	85% 50-150%
	13C5-PFHxA	87% 50-150%
	13C4-PFHpA	85% 50-150%

Method Blank Summary

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MB	2Q60362.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	88% 50-150%
	13C9-PFNA	86% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	90% 40-140%
	13C2-PFDoDA	88% 40-140%
	13C2-PFTeDA	84% 30-130%
	13C3-PFBS	86% 50-150%
	13C3-PFHxS	86% 50-150%
	13C8-PFOS	92% 50-150%
	13C8-FOSA	86% 30-130%
	d3-MeFOSAA	96% 50-150%
	d5-EtFOSAA	94% 50-150%
	13C2-4:2FTS	81% 50-150%
	13C2-6:2FTS	84% 50-150%
	13C2-8:2FTS	85% 50-150%

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q126-IBLK	4Q9165.D	1	12/15/20	MV	n/a	n/a	S4Q126

The QC reported here applies to the following samples: Method: EPA 537M QSM5.3 B-15

FA81615-24, FA81615-25, FA81615-26

CAS No.	Compound	Result	RL	MDL	Units	Q
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	88% 50-150%
	13C8-PFOA	87% 50-150%
	13C9-PFNA	91% 50-150%
	13C3-PFBS	88% 50-150%
	13C3-PFHxS	88% 50-150%
	13C8-PFOS	85% 50-150%

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q883-IBLK	2Q60312.D	1	12/23/20	NAF	n/a	n/a	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA81615-17, FA81615-19

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C5-PFHxA	93% 50-150%
	13C4-PFHpA	92% 50-150%
	13C8-PFOA	96% 50-150%
	13C9-PFNA	96% 50-150%

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q883-IBLK	2Q60312.D	1	12/23/20	NAF	n/a	n/a	S2Q883

The QC reported here applies to the following samples: Method: EPA 537M QSM5.3 B-15

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	Limits
	13C6-PFDA	101% 50-150%
	13C7-PFUnDA	100% 50-150%
	13C2-PFDoDA	101% 50-150%
	13C2-PFTeDA	103% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	90% 50-150%
	13C8-PFOS	98% 50-150%
	d3-MeFOSAA	103% 50-150%
	d5-EtFOSAA	104% 50-150%

Blank Spike Summary

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-BS	4Q9178.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0766	96	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0737	92	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0735	92	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0735	92	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0749	94	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0722	90	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0752	94	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0735	92	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0742	93	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0770	96	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0758	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0763	95	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0736	92	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0719	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0762	95	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0755	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0746	93	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0671	84	60-130
754-91-6	PFOSA	0.08	0.0692	87	70-130
2355-31-9	MeFOSAA	0.08	0.0721	90	70-130
2991-50-6	EtFOSAA	0.08	0.0741	93	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0730	91	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0735	92	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0734	92	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0741	93	60-140
919005-14-4	ADONA	0.08	0.0709	89	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0686	86	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0744	93	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	85%	35-135%
	13C5-PFPeA	94%	50-150%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	95%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-BS	4Q9178.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	94%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	96%	50-150%
	13C7-PFUnDA	95%	40-140%
	13C2-PFDoDA	90%	40-140%
	13C2-PFTeDA	92%	30-130%
	13C3-PFBS	93%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	94%	50-150%
	13C8-FOSA	106%	30-130%
	d3-MeFOSAA	89%	50-150%
	d5-EtFOSAA	86%	50-150%
	13C2-4:2FTS	99%	50-150%
	13C2-6:2FTS	104%	50-150%
	13C2-8:2FTS	105%	50-150%
	13C3-HFPO-DA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-BS	4Q9267.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0775	97	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0758	95	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0753	94	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0751	94	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0764	96	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0748	94	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0766	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0754	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0763	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0787	98	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0794	99	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0767	96	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0735	92	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0757	95	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0791	99	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0783	98	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0767	96	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0683	85	60-130
754-91-6	PFOSA	0.08	0.0728	91	70-130
2355-31-9	MeFOSAA	0.08	0.0755	94	70-130
2991-50-6	EtFOSAA	0.08	0.0763	95	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0749	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0751	94	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0757	95	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0745	93	60-140
919005-14-4	ADONA	0.08	0.0726	91	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0683	85	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0742	93	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	83%	35-135%
	13C5-PFPeA	89%	50-150%
	13C5-PFHxA	90%	50-150%
	13C4-PFHpA	91%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-BS	4Q9267.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	90%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	89%	40-140%
	13C2-PFDoDA	86%	40-140%
	13C2-PFTeDA	89%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	88%	50-150%
	13C8-FOSA	106%	30-130%
	d3-MeFOSAA	92%	50-150%
	d5-EtFOSAA	90%	50-150%
	13C2-4:2FTS	95%	50-150%
	13C2-6:2FTS	99%	50-150%
	13C2-8:2FTS	101%	50-150%
	13C3-HFPO-DA	81%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-BS	2Q60361.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.0741	0.0662	89	70-130
2706-90-3	Perfluoropentanoic acid	0.0741	0.0672	91	70-130
307-24-4	Perfluorohexanoic acid	0.0741	0.0658	89	70-130
375-85-9	Perfluoroheptanoic acid	0.0741	0.0682	92	70-130
335-67-1	Perfluorooctanoic acid	0.0741	0.0678	92	70-130
375-95-1	Perfluorononanoic acid	0.0741	0.0644	87	70-130
335-76-2	Perfluorodecanoic acid	0.0741	0.0655	88	70-130
2058-94-8	Perfluoroundecanoic acid	0.0741	0.0661	89	70-130
307-55-1	Perfluorododecanoic acid	0.0741	0.0669	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.0741	0.0660	89	65-130
376-06-7	Perfluorotetradecanoic acid	0.0741	0.0650	88	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0741	0.0638	86	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0741	0.0626	85	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0741	0.0672	91	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0741	0.0674	91	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0741	0.0678	92	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0741	0.0660	89	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0741	0.0631	85	60-130
754-91-6	PFOSA	0.0741	0.0658	89	70-130
2355-31-9	MeFOSAA	0.0741	0.0640	86	70-130
2991-50-6	EtFOSAA	0.0741	0.0641	87	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0741	0.0668	90	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0741	0.0662	89	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.0741	0.0654	88	70-130
13252-13-6	HFPO-DA (GenX)	0.0741	0.0530	72	60-140
919005-14-4	ADONA	0.0741	0.0627	85	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0741	0.0712	96	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0741	0.0635	86	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	80%	35-135%
	13C5-PFPeA	80%	50-150%
	13C5-PFHxA	81%	50-150%
	13C4-PFHpA	80%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-BS	2Q60361.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	83%	50-150%
	13C9-PFNA	82%	50-150%
	13C6-PFDA	87%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	81%	30-130%
	13C3-PFBS	81%	50-150%
	13C3-PFHxS	80%	50-150%
	13C8-PFOS	86%	50-150%
	13C8-FOSA	78%	30-130%
	d3-MeFOSAA	92%	50-150%
	d5-EtFOSAA	88%	50-150%
	13C2-4:2FTS	80%	50-150%
	13C2-6:2FTS	83%	50-150%
	13C2-8:2FTS	85%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MS	2Q60371.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-1	2Q60370.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	FA81780-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0070		0.0714	0.0686	86	70-130
2706-90-3	Perfluoropentanoic acid	0.0182		0.0714	0.0819	89	70-130
307-24-4	Perfluorohexanoic acid	0.0163		0.0714	0.0763	84	70-130
375-85-9	Perfluoroheptanoic acid	0.0087		0.0714	0.0727	90	70-130
335-67-1	Perfluorooctanoic acid	0.0082		0.0714	0.0708	88	70-130
375-95-1	Perfluorononanoic acid	0.0011	J	0.0714	0.0622	86	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0615	86	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0631	88	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0633	89	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0613	86	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0605	85	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0039		0.0714	0.0631	83	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0044		0.0714	0.0616	80	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0359		0.0714	0.102	93	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0016	J	0.0714	0.0681	93	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0699		0.0714	0.136	93	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0611	86	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0587	82	60-130
754-91-6	PFOSA	ND		0.0714	0.0626	88	70-130
2355-31-9	MeFOSAA	ND		0.0714	0.0622	87	70-130
2991-50-6	EtFOSAA	ND		0.0714	0.0613	86	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0625	87	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0623	87	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0631	88	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0497	70	60-140
919005-14-4	ADONA	ND		0.0714	0.0587	82	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0654	92	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0598	84	60-140

CAS No.	ID Standard Recoveries	MS	FA81780-1	Limits
	13C4-PFBA	78%	82%	35-135%
	13C5-PFPeA	78%	82%	50-150%
	13C5-PFHxA	80%	84%	50-150%
	13C4-PFHpA	78%	83%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: FA81615

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MS	2Q60371.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-1	2Q60370.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	MS	FA81780-1	Limits
	13C8-PFOA	81%	87%	50-150%
	13C9-PFNA	80%	85%	50-150%
	13C6-PFDA	84%	91%	50-150%
	13C7-PFUnDA	79%	87%	40-140%
	13C2-PFDoDA	76%	85%	40-140%
	13C2-PFTeDA	79%	87%	30-130%
	13C3-PFBS	80%	84%	50-150%
	13C3-PFHxS	75%	83%	50-150%
	13C8-PFOS	84%	91%	50-150%
	13C8-FOSA	79%	87%	30-130%
	d3-MeFOSAA	86%	95%	50-150%
	d5-EtFOSAA	82%	90%	50-150%
	13C2-4:2FTS	77%	78%	50-150%
	13C2-6:2FTS	82%	82%	50-150%
	13C2-8:2FTS	81%	84%	50-150%
	13C3-HFPO-DA		95%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MS	4Q9226.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
OP83375-MSD	4Q9227.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
FA81615-20	4Q9225.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	FA81615-20		Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q								
375-22-4	Perfluorobutanoic acid	0.0119		0.0741	0.0817	94	0.0769	0.0847	95	4	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0017	J	0.0741	0.0692	91	0.0769	0.0721	92	4	70-130/30
307-24-4	Perfluorohexanoic acid	0.0011	J	0.0741	0.0690	92	0.0769	0.0721	92	4	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0741	0.0693	94	0.0769	0.0719	93	4	70-130/30
335-67-1	Perfluorooctanoic acid	0.0011	J	0.0741	0.0709	94	0.0769	0.0730	93	3	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0672	91	0.0769	0.0701	91	4	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0688	93	0.0769	0.0718	93	4	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0674	91	0.0769	0.0701	91	4	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0689	93	0.0769	0.0720	94	4	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0927	125	0.0769	0.0926	120	0	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0695	94	0.0769	0.0733	95	5	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0014	J	0.0741	0.0694	92	0.0769	0.0739	94	6	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0721	97	0.0769	0.0759	99	5	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0741	0.0689	93	0.0769	0.0717	93	4	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0749	101	0.0769	0.0769	100	3	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0032		0.0741	0.0712	92	0.0769	0.0742	92	4	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0696	94	0.0769	0.0713	93	2	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0559	75	0.0769	0.0563	73	1	60-130/30
754-91-6	PFOSA	ND		0.0741	0.0676	91	0.0769	0.0694	90	3	70-130/30
2355-31-9	MeFOSAA	ND		0.0741	0.0674	91	0.0769	0.0709	92	5	70-130/30
2991-50-6	EtFOSAA	ND		0.0741	0.0688	93	0.0769	0.0725	94	5	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0741	0.0665	90	0.0769	0.0701	91	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0676	91	0.0769	0.0705	92	4	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0678	92	0.0769	0.0713	93	5	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0741	0.0703	95	0.0769	0.0745	97	6	60-140/30
919005-14-4	ADONA	ND		0.0741	0.0628	85	0.0769	0.0671	87	7	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0741	0.0616	83	0.0769	0.0644	84	4	60-140/30
763051-92-911	Cl-PF3OUdS (F-53B Minor)	ND		0.0741	0.0708	96	0.0769	0.0757	98	7	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-20	Limits
13C4-PFBA		64%	66%	72%	35-135%
13C5-PFPeA		69%	70%	75%	50-150%
13C5-PFHxA		73%	73%	79%	50-150%
13C4-PFHpA		77%	77%	83%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MS	4Q9226.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
OP83375-MSD	4Q9227.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
FA81615-20	4Q9225.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-20	Limits
13C8-PFOA		80%	79%	85%	50-150%
13C9-PFNA		84%	82%	90%	50-150%
13C6-PFDA		85%	82%	90%	50-150%
13C7-PFUnDA		83%	78%	85%	40-140%
13C2-PFDoDA		68%	62%	69%	40-140%
13C2-PFTeDA		38%	38%	33%	30-130%
13C3-PFBS		71%	70%	76%	50-150%
13C3-PFHxS		77%	77%	83%	50-150%
13C8-PFOS		80%	77%	84%	50-150%
13C8-FOSA		61%	65%	62%	30-130%
d3-MeFOSAA		89%	84%	93%	50-150%
d5-EtFOSAA		89%	84%	91%	50-150%
13C2-4:2FTS		81%	80%	82%	50-150%
13C2-6:2FTS		92%	91%	93%	50-150%
13C2-8:2FTS		99%	94%	99%	50-150%
13C3-HFPO-DA		66%	65%	70%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MS	4Q9272.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
OP83388-MSD	4Q9273.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
FA81615-1	4Q9269.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	Compound	FA81615-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0044		0.0741	0.0775	99	0.08	0.0788	93	2	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0023		0.0741	0.0726	95	0.08	0.0749	91	3	70-130/30
307-24-4	Perfluorohexanoic acid	0.0016	J	0.0741	0.0714	94	0.08	0.0735	90	3	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0012	J	0.0741	0.0722	96	0.08	0.0744	92	3	70-130/30
335-67-1	Perfluorooctanoic acid	0.0030		0.0741	0.0758	98	0.08	0.0774	93	2	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0693	94	0.08	0.0701	88	1	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0709	96	0.08	0.0733	92	3	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0701	95	0.08	0.0721	90	3	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0717	97	0.08	0.0726	91	1	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.134	181*	0.08	0.0786	98	52*	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0732	99	0.08	0.0763	95	4	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0026		0.0741	0.0731	95	0.08	0.0793	96	8	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0799	108	0.08	0.0843	105	5	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0014	J	0.0741	0.0712	94	0.08	0.0746	92	5	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0782	106	0.08	0.0766	96	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0038		0.0741	0.0716	92	0.08	0.0756	90	5	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0662	89	0.08	0.0636	80	4	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0498	67	0.08	0.0398	50*	22	60-130/30
754-91-6	PFOSA	ND		0.0741	0.0700	95	0.08	0.0718	90	3	70-130/30
2355-31-9	MeFOSAA	ND		0.0741	0.0715	97	0.08	0.0740	93	3	70-130/30
2991-50-6	EtFOSAA	ND		0.0741	0.0735	99	0.08	0.0766	96	4	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0741	0.0705	95	0.08	0.0716	90	2	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0695	94	0.08	0.0726	91	4	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0698	94	0.08	0.0726	91	4	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0741	0.0725	98	0.08	0.0757	95	4	60-140/30
919005-14-4	ADONA	ND		0.0741	0.0657	89	0.08	0.0675	84	3	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0741	0.0623	84	0.08	0.0652	82	5	60-140/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0741	0.0997	135	0.08	0.124	155*	22	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-1	Limits
	13C4-PFBA	59%	60%	59%	35-135%
	13C5-PFPeA	61%	62%	60%	50-150%
	13C5-PFHxA	67%	67%	66%	50-150%
	13C4-PFHpA	73%	73%	71%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MS	4Q9272.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
OP83388-MSD	4Q9273.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
FA81615-1	4Q9269.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-1	Limits
13C8-PFOA		77%	77%	76%	50-150%
13C9-PFNA		84%	80%	80%	50-150%
13C6-PFDA		86%	77%	81%	50-150%
13C7-PFUnDA		77%	60%	76%	40-140%
13C2-PFDoDA		45%	25%* a	63%	40-140%
13C2-PFTeDA		8%* a	9%* a	16%* a	30-130%
13C3-PFBS		65%	62%	62%	50-150%
13C3-PFHxS		76%	76%	74%	50-150%
13C8-PFOS		82%	73%	76%	50-150%
13C8-FOSA		34%	28%* a	40%	30-130%
d3-MeFOSAA		89%	72%	94%	50-150%
d5-EtFOSAA		85%	64%	87%	50-150%
13C2-4:2FTS		75%	75%	69%	50-150%
13C2-6:2FTS		92%	91%	86%	50-150%
13C2-8:2FTS		104%	91%	93%	50-150%
13C3-HFPO-DA		59%	60%	59%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-DUP	2Q60373.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-2 ^a	2Q60372.D	1.5	12/24/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	FA81780-2 ug/l	DUP Q	ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0108		0.0070		43*	30
2706-90-3	Perfluoropentanoic acid	0.0283		0.0184		42*	30
307-24-4	Perfluorohexanoic acid	0.0258		0.0164		45*	30
375-85-9	Perfluoroheptanoic acid	0.0140		0.0092		41*	30
335-67-1	Perfluorooctanoic acid	0.0132		0.0086		42*	30
375-95-1	Perfluorononanoic acid	0.0018	J	0.0011	J	48*	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0063		0.0039		47*	30
2706-91-4	Perfluoropentanesulfonic acid	0.0069		0.0045		42*	30
355-46-4	Perfluorohexanesulfonic acid	0.0548		0.0361		41*	30
375-92-8	Perfluoroheptanesulfonic acid	0.0025	J	0.0018		33*	30
1763-23-1	Perfluorooctanesulfonic acid	0.110		0.0716		42*	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-911	Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81780-2	Limits
	13C4-PFBA	81%	126%	35-135%
	13C5-PFPeA	81%	125%	50-150%
	13C5-PFHxA	83%	127%	50-150%
	13C4-PFHpA	81%	126%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Page 2 of 2

Job Number: FA81615
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-DUP	2Q60373.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-2 ^a	2Q60372.D	1.5	12/24/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	DUP	FA81780-2	Limits
	13C8-PFOA	85%	131%	50-150%
	13C9-PFNA	84%	130%	50-150%
	13C6-PFDA	89%	137%	50-150%
	13C7-PFUnDA	85%	128%	40-140%
	13C2-PFDoDA	83%	125%	40-140%
	13C2-PFTeDA	86%	129%	30-130%
	13C3-PFBS	82%	129%	50-150%
	13C3-PFHxS	83%	132%	50-150%
	13C8-PFOS	90%	140%	50-150%
	13C8-FOSA	84%	137%* ^b	30-130%
	d3-MeFOSAA	92%	138%	50-150%
	d5-EtFOSAA	89%	134%	50-150%
	13C2-4:2FTS	77%	121%	50-150%
	13C2-6:2FTS	82%	129%	50-150%
	13C2-8:2FTS	84%	126%	50-150%
	13C3-HFPO-DA		147%	50-150%

(a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.

(b) Outside control limits.

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA82792

Sampling Date: 02/01/21



Report to:

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Total number of pages in report: **44**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Arcadis

Job No: FA82792

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

FA82792-1	02/01/21	09:59	AMAH02/02/21	AQ	Ground Water	P2-MH-NW_020121
FA82792-2	02/01/21	10:30	AMAH02/02/21	AQ	Ground Water	P2-MH-32_020121
FA82792-2D	02/01/21	10:30	AMAH02/02/21	AQ	Water Dup/MSD	P2-MH-32_020121
FA82792-2S	02/01/21	10:30	AMAH02/02/21	AQ	Water Matrix Spike	P2-MH-32_020121
FA82792-3	02/01/21	12:28	AMAH02/02/21	AQ	Ground Water	P2-MH-29_020121
FA82792-4	02/01/21	13:00	AMAH02/02/21	AQ	Ground Water	P2-MH-30_020121
FA82792-5	02/01/21	13:17	AMAH02/02/21	AQ	Ground Water	P2-MH-2_020121
FA82792-6	02/01/21	00:00	AMAH02/02/21	AQ	Ground Water	DUP-01_020121
FA82792-7	02/01/21	13:20	AMAH02/02/21	AQ	Field Blank Water	FB-01_020121
FA82792-8	02/01/21	13:26	AMAH02/02/21	AQ	Equipment Blank	EB-01_020121

Summary of Hits

Job Number: FA82792
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 02/01/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA82792-1 P2-MH-NW_020121

Perfluorobutanoic acid	0.0089	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0061	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0084	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0063	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0111	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0079	0.0018	0.00089	ug/l	EPA 537M BY ID

FA82792-2 P2-MH-32_020121

Perfluorobutanoic acid	0.0102	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0052	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID

FA82792-3 P2-MH-29_020121

Perfluorobutanoic acid	0.0101	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid ^a	0.0077	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid ^a	0.0055	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0059	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0058	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a	0.251	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0124	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid	0.0073	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0587	0.0018	0.00089	ug/l	EPA 537M BY ID

FA82792-4 P2-MH-30_020121

Perfluorobutanoic acid	0.0076	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0037	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0052	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0044	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0083	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0282	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0042	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0290	0.0018	0.00089	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	0.0035 J	0.0071	0.0018	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA82792
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 02/01/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA82792-5 P2-MH-2_020121

Perfluorobutanoic acid	0.0074	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0056	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0041	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0087	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0010 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0070	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0106	0.0018	0.00089	ug/l	EPA 537M BY ID

FA82792-6 DUP-01_020121

Perfluorobutanoic acid	0.0077	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0043	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0060	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0049	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0085	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0064	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0025	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0107	0.0018	0.00089	ug/l	EPA 537M BY ID

FA82792-7 FB-01_020121

No hits reported in this sample.

FA82792-8 EB-01_020121

No hits reported in this sample.

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	P2-MH-NW_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-1	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63078.D	1	02/13/21 06:35	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 ^a	2Q63172.D	5	02/14/21 22:14	NAF	02/10/21 08:40	OP84056	S2Q919

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0089	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0061	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0084	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0063	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0111	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0022	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0079	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA ^b	ND	0.0036	0.0018	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-NW_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-1	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%	86%	35-135%
	13C5-PFPeA	69%	86%	50-150%
	13C5-PFHxA	66%	85%	50-150%
	13C4-PFHpA	67%	84%	50-150%
	13C8-PFOA	71%	84%	50-150%
	13C9-PFNA	77%	87%	50-150%
	13C6-PFDA	74%	86%	50-150%
	13C7-PFUnDA	70%	80%	40-140%
	13C2-PFDoDA	68%	74%	40-140%
	13C2-PFTeDA	24% ^c	39%	30-130%
	13C3-PFBS	71%	85%	50-150%
	13C3-PFHxS	72%	83%	50-150%
	13C8-PFOS	74%	85%	50-150%
	13C8-FOSA	20% ^c	52%	30-130%
	d3-MeFOSAA	102%	94%	40-140%
	d5-EtFOSAA	102%	86%	40-140%
	13C2-4:2FTS	66%	84%	50-150%
	13C2-6:2FTS	76%	91%	50-150%
	13C2-8:2FTS	85%	89%	50-150%
	13C3-HFPO-DA	63%	89%	50-150%

(a) Confirmation run.

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-32_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-2	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63435.D	1	02/17/21 20:20	NAF	02/16/21 12:40	OP84148	S2Q922
Run #2 ^a	2Q63173.D	5	02/14/21 22:29	NAF	02/10/21 08:40	OP84056	S2Q919

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0102	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0015	0.0018	0.00089	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0019	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0052	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0017	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA ^b	ND	0.0036	0.0018	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-32_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-2	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	56%	76%	35-135%
	13C5-PFPeA	60%	76%	50-150%
	13C5-PFHxA	59%	73%	50-150%
	13C4-PFHpA	59%	73%	50-150%
	13C8-PFOA	70%	77%	50-150%
	13C9-PFNA	79%	78%	50-150%
	13C6-PFDA	90%	81%	50-150%
	13C7-PFUnDA	86%	76%	40-140%
	13C2-PFDoDA	93%	69%	40-140%
	13C2-PFTeDA	67%	17% ^c	30-130%
	13C3-PFBS	58%	76%	50-150%
	13C3-PFHxS	71%	76%	50-150%
	13C8-PFOS	90%	88%	50-150%
	13C8-FOSA	16% ^c	21% ^c	30-130%
	d3-MeFOSAA	83%	100%	40-140%
	d5-EtFOSAA	90%	95%	40-140%
	13C2-4:2FTS	50%	73%	50-150%
	13C2-6:2FTS	70%	83%	50-150%
	13C2-8:2FTS	101%	89%	50-150%
	13C3-HFPO-DA	80%	84%	50-150%

(a) Confirmation run.

(b) Associated ID Standard outside control limits, Confirmed by batch QC.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-29_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-3	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63438.D	1	02/17/21 21:05	NAF	02/16/21 12:40	OP84148	S2Q922
Run #2 ^a	2Q63082.D	1	02/13/21 07:34	NAF	02/10/21 08:40	OP84056	S2Q918

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0101	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid ^b	0.0077	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid ^b	0.0055	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0059	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0058	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid ^b	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid ^b	0.251	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid ^b	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0124	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0073	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0587	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA ^b	ND	0.0036	0.0018	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate ^b	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-29_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-3	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Mino ^b)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	39%	28% ^c	35-135%
	13C5-PFPeA	45% ^c	31% ^c	50-150%
	13C5-PFHxA	45% ^c	30% ^c	50-150%
	13C4-PFHpA	50%	34% ^c	50-150%
	13C8-PFOA	64%	41% ^c	50-150%
	13C9-PFNA	78%	51%	50-150%
	13C6-PFDA	80%	55%	50-150%
	13C7-PFUnDA	56%	52%	40-140%
	13C2-PFDoDA	35% ^c	46%	40-140%
	13C2-PFTeDA	33%	14% ^c	30-130%
	13C3-PFBS	49% ^c	39% ^c	50-150%
	13C3-PFHxS	68%	46% ^c	50-150%
	13C8-PFOS	84%	55%	50-150%
	13C8-FOSA	11% ^c	7% ^c	30-130%
	d3-MeFOSAA	59%	57%	40-140%
	d5-EtFOSAA	61%	62%	40-140%
	13C2-4:2FTS	39% ^c	26% ^c	50-150%
	13C2-6:2FTS	64%	39% ^c	50-150%
	13C2-8:2FTS	87%	59%	50-150%
	13C3-HFPO-DA	65%	35% ^c	50-150%

(a) Confirmation run for ID Standard Recoveries.

(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-30_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-4	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63083.D	1	02/13/21 07:49	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 ^a	2Q63177.D	5	02/14/21 23:28	NAF	02/10/21 08:40	OP84056	S2Q919

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0076	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0037	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0052	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0044	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0083	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND ^c	0.0089	0.0045	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0282	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0042	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0290	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND ^c	0.018	0.0089	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0035	0.0071	0.0018	ug/l	J

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-30_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-4	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	83%	35-135%
	13C5-PFPeA	64%	83%	50-150%
	13C5-PFHxA	62%	81%	50-150%
	13C4-PFHpA	64%	81%	50-150%
	13C8-PFOA	69%	84%	50-150%
	13C9-PFNA	74%	87%	50-150%
	13C6-PFDA	70%	87%	50-150%
	13C7-PFUnDA	64%	83%	40-140%
	13C2-PFDoDA	56%	73%	40-140%
	13C2-PFTeDA	12% ^d	21% ^d	30-130%
	13C3-PFBS	67%	85%	50-150%
	13C3-PFHxS	71%	80%	50-150%
	13C8-PFOS	75%	89%	50-150%
	13C8-FOSA	15% ^d	41%	30-130%
	d3-MeFOSAA	90%	96%	40-140%
	d5-EtFOSAA	89%	89%	40-140%
	13C2-4:2FTS	61%	80%	50-150%
	13C2-6:2FTS	71%	87%	50-150%
	13C2-8:2FTS	80%	91%	50-150%
	13C3-HFPO-DA	59%	84%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Result is from Run# 2

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-2_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-5	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63086.D	1	02/13/21 08:33	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 ^a	2Q63178.D	5	02/14/21 23:42	NAF	02/10/21 08:40	OP84056	S2Q919

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0074	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0036	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0056	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0041	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0087	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0010	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0070	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0106	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA ^b	ND	0.0036	0.0018	ug/l	

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MH-2_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-5	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%	75%	35-135%
	13C5-PFPeA	61%	73%	50-150%
	13C5-PFHxA	59%	72%	50-150%
	13C4-PFHpA	61%	72%	50-150%
	13C8-PFOA	64%	73%	50-150%
	13C9-PFNA	66%	74%	50-150%
	13C6-PFDA	65%	73%	50-150%
	13C7-PFUnDA	58%	64%	40-140%
	13C2-PFDoDA	55%	55%	40-140%
	13C2-PFTeDA	33%	27% ^c	30-130%
	13C3-PFBS	64%	73%	50-150%
	13C3-PFHxS	66%	72%	50-150%
	13C8-PFOS	66%	70%	50-150%
	13C8-FOSA	23% ^c	54%	30-130%
	d3-MeFOSAA	88%	77%	40-140%
	d5-EtFOSAA	91%	76%	40-140%
	13C2-4:2FTS	58%	73%	50-150%
	13C2-6:2FTS	67%	78%	50-150%
	13C2-8:2FTS	70%	71%	50-150%
	13C3-HFPO-DA	57%	76%	50-150%

(a) Confirmation run for ID Standard Recoveries.

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-6	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63087.D	1	02/13/21 08:48	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 ^a	2Q63179.D	5	02/14/21 23:57	NAF	02/10/21 08:40	OP84056	S2Q919

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0077	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0043	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0060	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0049	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0085	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0064	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0025	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0107	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA ^b	ND	0.0036	0.0018	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-6	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%	84%	35-135%
	13C5-PFPeA	69%	83%	50-150%
	13C5-PFHxA	66%	80%	50-150%
	13C4-PFHpA	68%	80%	50-150%
	13C8-PFOA	73%	83%	50-150%
	13C9-PFNA	76%	86%	50-150%
	13C6-PFDA	75%	93%	50-150%
	13C7-PFUnDA	73%	90%	40-140%
	13C2-PFDoDA	76%	83%	40-140%
	13C2-PFTeDA	40%	50%	30-130%
	13C3-PFBS	72%	82%	50-150%
	13C3-PFHxS	74%	83%	50-150%
	13C8-PFOS	78%	89%	50-150%
	13C8-FOSA	21% ^c	55%	30-130%
	d3-MeFOSAA	104%	100%	40-140%
	d5-EtFOSAA	110%	103%	40-140%
	13C2-4:2FTS	65%	82%	50-150%
	13C2-6:2FTS	77%	91%	50-150%
	13C2-8:2FTS	86%	93%	50-150%
	13C3-HFPO-DA	63%	89%	50-150%

(a) Confirmation run for ID Standard Recoveries.

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-01_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-7	Date Received:	02/02/21
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63088.D	1	02/13/21 09:03	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROOCCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: FB-01_020121

Lab Sample ID: FA82792-7

Date Sampled: 02/01/21

Matrix: AQ - Field Blank Water

Date Received: 02/02/21

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	89%		35-135%
	13C5-PFPeA	90%		50-150%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	96%		50-150%
	13C7-PFUnDA	97%		40-140%
	13C2-PFDoDA	101%		40-140%
	13C2-PFTeDA	108%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	88%		30-130%
	d3-MeFOSAA	107%		40-140%
	d5-EtFOSAA	105%		40-140%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	90%		50-150%
	13C3-HFPO-DA	83%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-8	Date Received:	02/02/21
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63089.D	1	02/13/21 09:17	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: EB-01_020121

Lab Sample ID: FA82792-8

Date Sampled: 02/01/21

Matrix: AQ - Equipment Blank

Date Received: 02/02/21

Method: EPA 537M BY ID EPA 537 MOD

Percent Solids: n/a

Project: Racer Lansing PFAS Delineation; Lansing, MI

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

NEXT GENERATION PFAS ANALYTES

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	91%		35-135%
	13C5-PFPeA	93%		50-150%
	13C5-PFHxA	92%		50-150%
	13C4-PFHpA	93%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	96%		50-150%
	13C7-PFUnDA	98%		40-140%
	13C2-PFDoDA	101%		40-140%
	13C2-PFTeDA	99%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	93%		50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	107%		40-140%
	d5-EtFOSAA	108%		40-140%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	92%		50-150%
	13C3-HFPO-DA	88%		50-150%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Page 1 of 1

Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.

The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

4405 Vineland Road, Suite C-15 Orlando, FL 32811
TEL: 407-425-6700 FAX: 407-425-0707

www.sps.com

SGS - ORLANDO Quote #

SKIFF #	

Client / Reporting Information				Project Information				Analytical Information												Matrix Codes																																																				
Company Name: Arcadis				Project Name: PACER Lansing PFAS Delineation																DW - Drinking Water																																																				
Address: 2550 Cabot Dr. Ste 500				Street																GW - Ground Water																																																				
City: Novi		State: MI		Zip: 48377		City: Lansing		State: MI														WW - Wastewater																																																		
Project Contact: Marina Samp marina.samp@arcadis.com				Project #: 30075941.03600																SW - Surface Water																																																				
Phone #: 248-994-2318				Fax #:																SO - Soil																																																				
Sampler(s) Name(s) (Printed) Sampler 1: A. Mandel Sampler 2: A. Hartz				Client Purchase Order #:																SL - Sludge																																																				
																				OI - Oil																																																				
																				LIQ - Other Liquid																																																				
																				AIR - Air																																																				
																				SOL - Other Solid																																																				
SGS Orlando Sample #				Field ID / Point of Collection				DATE				TIME				SAMPLED BY:				MATRIX				TOTAL # OF BOTTLES				OTHER				NONE				HCl				NaOH				HNO3				H2SO4				NaOH/ZnAc				DI WATER				MEOH				PEAS				EPA 837 V (ME-1st of 2)				LAB USE ONLY
1				P2-MH-NW-020121				2/1/21				0959 AM				NW				2								X																																												
2				P2-MH-32-020121				2/1/21				1030 AM				NW				6								X																																												
3				P2-MH-29-020121				2/1/21				1228 AM				NW				2								X																																												
4				P2-MH-30-020121				2/1/21				1300 AM				NW				2								X																																												
5				P2-MH-2-020121				2/1/21				1317 AM				NW				2								X																																												
6				Dup-01-020121				2/1/21								AM				2								X																																												
7				FB-01-020121				2/1/21				1320 AM				NW				2								X																																												
8				FB-01-020121				2/1/21				1326 AM				NW				2								X																																												

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

<http://www.sqs.com/en/terms-and-conditions>

FA82792: Chain of Custody

Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA82792

Client: ARCADIS

Project: RACER LANSING PFAS DELINEATION

Date / Time Received: 2/2/2021 9:30:00 AM

Delivery Method: FED EX

Airbill #s: 923153837582

Therm ID: IR 1;

Therm CF: -1.8;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (2.0);

Cooler Information

Y or N

1. Custody Seals Present	☒	☐
2. Custody Seals Intact	☒	☐
3. Temp criteria achieved	☒	☐
4. Cooler temp verification	<u>IR Gun</u>	
5. Cooler media	<u>Ice (Bag)</u>	

Trip Blank Information

Y or N N/A

1. Trip Blank present / cooler	☐	☐	☒
2. Trip Blank listed on COC	☐	☐	☒
	<u>W or S</u>	<u>N/A</u>	
3. Type Of TB Received	☐	☐	☒

Sample Information

Y or N N/A

1. Sample labels present on bottles	☒	☐	
2. Samples preserved properly	☒	☐	
3. Sufficient volume/containers recvd for analysis:	☒	☐	
4. Condition of sample	<u>Intact</u>		
5. Sample recvd within HT	☒	☐	
6. Dates/Times/IDs on COC match Sample Label	☒	☐	
7. VOCs have headspace	☐	☐	☒
8. Bottles received for unspecified tests	☐	☒	
9. Compositing instructions clear	☐	☐	☒
10. Voa Soil Kits/Jars received past 48hrs?	☐	☐	☒
11. % Solids Jar received?	☐	☐	☒
12. Residual Chlorine Present?	☐	☐	☒

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____
 Test Strip Lot #s: pH 0-3 _____ 230315 _____
 Residual Chlorine Test Strip Lot #: _____

Number of 5035 Field Kits: _____
 pH 10-12 _____ 219813A _____

Number of Lab Filtered Metals: _____
 Other: (Specify) _____

Comments

SM001
Rev. Date 05/24/17

Technician: CARLOSD

Date: 2/2/2021 9:30:00 AM

Reviewer: _____

Date: _____

FA82792: Chain of Custody

Page 2 of 2

MS Semi-volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 2

Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MB	2Q63065.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	81% 35-135%
	13C5-PFPeA	82% 50-150%
	13C5-PFHxA	81% 50-150%
	13C4-PFHpA	81% 50-150%

Method Blank Summary

Page 2 of 2

Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MB	2Q63065.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	83% 50-150%
	13C9-PFNA	84% 50-150%
	13C6-PFDA	84% 50-150%
	13C7-PFUnDA	83% 40-140%
	13C2-PFDoDA	78% 40-140%
	13C2-PFTeDA	41% 30-130%
	13C3-PFBS	81% 50-150%
	13C3-PFHxS	83% 50-150%
	13C8-PFOS	82% 50-150%
	13C8-FOSA	73% 30-130%
	d3-MeFOSAA	87% 40-140%
	d5-EtFOSAA	86% 40-140%
	13C2-4:2FTS	77% 50-150%
	13C2-6:2FTS	76% 50-150%
	13C2-8:2FTS	78% 50-150%
	13C3-HFPO-DA	80% 50-150%

Method Blank Summary

Page 1 of 2

Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MB	2Q63431.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	96% 35-135%
	13C5-PFPeA	102% 50-150%
	13C5-PFHxA	106% 50-150%
	13C4-PFHpA	103% 50-150%

Method Blank Summary

Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MB	2Q63431.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	ID	Standard Recoveries	Limits
	13C8-PFOA	106%	50-150%
	13C9-PFNA	104%	50-150%
	13C6-PFDA	103%	50-150%
	13C7-PFUnDA	101%	40-140%
	13C2-PFDoDA	106%	40-140%
	13C2-PFTeDA	98%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	101%	50-150%
	13C8-PFOS	102%	50-150%
	13C8-FOSA	97%	30-130%
	d3-MeFOSAA	94%	40-140%
	d5-EtFOSAA	98%	40-140%
	13C2-4:2FTS	88%	50-150%
	13C2-6:2FTS	95%	50-150%
	13C2-8:2FTS	98%	50-150%
	13C3-HFPO-DA	125%	50-150%

Instrument Blank

Page 1 of 2

Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q918-IBLK	2Q63014.D	1	02/12/21	NAF	n/a	n/a	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19Cl	PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-911Cl	PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	89% 50-150%
	13C5-PFPeA	89% 50-150%
	13C5-PFHxA	89% 50-150%
	13C4-PFHpA	89% 50-150%

Instrument Blank

Page 2 of 2

Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q918-IBLK	2Q63014.D	1	02/12/21	NAF	n/a	n/a	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	91% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	95% 50-150%
	13C7-PFUnDA	98% 50-150%
	13C2-PFDoDA	104% 50-150%
	13C2-PFTeDA	120% 50-150%
	13C3-PFBS	90% 50-150%
	13C3-PFHxS	91% 50-150%
	13C8-PFOS	90% 50-150%
	13C8-FOSA	90% 50-150%
	d3-MeFOSAA	105% 50-150%
	d5-EtFOSAA	108% 50-150%
	13C2-4:2FTS	83% 50-150%
	13C2-6:2FTS	83% 50-150%
	13C2-8:2FTS	87% 50-150%

Instrument Blank

Page 1 of 1

Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q919-IBLK	2Q63137.D	1	02/14/21	NAF	n/a	n/a	S2Q919

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-4

CAS No.	Compound	Result	RL	MDL	Units	Q
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	100%
	13C5-PFPeA	99%
	13C5-PFHxA	99%
	13C4-PFHpA	100%
	13C8-PFOA	100%
	13C9-PFNA	99%
	13C6-PFDA	101%
	13C7-PFUnDA	100%
	13C2-PFDoDA	100%
	13C2-PFTeDA	99%
	13C3-PFBS	100%
	13C3-PFHxS	100%
	13C8-PFOS	100%
	13C8-FOSA	104%
	d3-MeFOSAA	101%
	d5-EtFOSAA	98%
	13C2-4:2FTS	94%
	13C2-6:2FTS	95%
	13C2-8:2FTS	93%
	13C3-HFPO-DA	97%

Instrument Blank

Page 1 of 2

Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q922-IBLK	2Q63403.D	1	02/17/21	NAF	n/a	n/a	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-2, FA82792-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19Cl	PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-911Cl	PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	104% 50-150%
	13C5-PFPeA	111% 50-150%
	13C5-PFHxA	114% 50-150%
	13C4-PFHpA	110% 50-150%

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Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q922-IBLK	2Q63403.D	1	02/17/21	NAF	n/a	n/a	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	114% 50-150%
	13C9-PFNA	113% 50-150%
	13C6-PFDA	112% 50-150%
	13C7-PFUnDA	114% 50-150%
	13C2-PFDoDA	118% 50-150%
	13C2-PFTeDA	117% 50-150%
	13C3-PFBS	108% 50-150%
	13C3-PFHxS	105% 50-150%
	13C8-PFOS	109% 50-150%
	13C8-FOSA	114% 50-150%
	d3-MeFOSAA	107% 50-150%
	d5-EtFOSAA	111% 50-150%
	13C2-4:2FTS	102% 50-150%
	13C2-6:2FTS	105% 50-150%
	13C2-8:2FTS	105% 50-150%
	13C3-HFPO-DA	127% 50-150%

Blank Spike Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-BS	2Q63064.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0726	91	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0781	98	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0749	94	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0764	96	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0761	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0758	95	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0739	92	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0751	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0723	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0661	83	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0754	94	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0753	94	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0761	95	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0740	93	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0777	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0762	95	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0775	97	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0694	87	60-130
754-91-6	PFOSA	0.08	0.0773	97	70-130
2355-31-9	MeFOSAA	0.08	0.0758	95	70-130
2991-50-6	EtFOSAA	0.08	0.0740	93	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0758	95	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0757	95	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0764	96	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0701	88	70-130
919005-14-4	ADONA	0.08	0.0715	89	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0647	81	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0674	84	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	84%	35-135%
	13C5-PFPeA	85%	50-150%
	13C5-PFHxA	84%	50-150%
	13C4-PFHpA	85%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-BS	2Q63064.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	84%	50-150%
	13C9-PFNA	88%	50-150%
	13C6-PFDA	88%	50-150%
	13C7-PFUnDA	90%	40-140%
	13C2-PFDoDA	95%	40-140%
	13C2-PFTeDA	57%	30-130%
	13C3-PFBS	84%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	84%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	95%	40-140%
	d5-EtFOSAA	96%	40-140%
	13C2-4:2FTS	84%	50-150%
	13C2-6:2FTS	82%	50-150%
	13C2-8:2FTS	88%	50-150%
	13C3-HFPO-DA	84%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-BS	2Q63430.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0777	97	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0695	87	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0742	93	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0702	88	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0742	93	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0699	87	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0757	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0754	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0756	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0670	84	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0722	90	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0804	101	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0827	103	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0717	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0762	95	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0715	89	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0741	93	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0760	95	60-130
754-91-6	PFOSA	0.08	0.0731	91	70-130
2355-31-9	MeFOSAA	0.08	0.0772	97	70-130
2991-50-6	EtFOSAA	0.08	0.0754	94	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0805	101	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0772	97	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0762	95	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0602	75	70-130
919005-14-4	ADONA	0.08	0.0668	84	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0702	88	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0694	87	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	105%	35-135%
	13C5-PFPeA	112%	50-150%
	13C5-PFHxA	116%	50-150%
	13C4-PFHpA	112%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FA82792

Account: ARCMIL Arcadis

Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-BS	2Q63430.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	114%	50-150%
	13C9-PFNA	113%	50-150%
	13C6-PFDA	113%	50-150%
	13C7-PFUnDA	113%	40-140%
	13C2-PFDoDA	116%	40-140%
	13C2-PFTeDA	103%	30-130%
	13C3-PFBS	97%	50-150%
	13C3-PFHxS	108%	50-150%
	13C8-PFOS	114%	50-150%
	13C8-FOSA	99%	30-130%
	d3-MeFOSAA	102%	40-140%
	d5-EtFOSAA	105%	40-140%
	13C2-4:2FTS	102%	50-150%
	13C2-6:2FTS	110%	50-150%
	13C2-8:2FTS	112%	50-150%
	13C3-HFPO-DA	136%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MS	2Q63174.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
OP84056-MSD	2Q63175.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
FA82792-2 ^a	2Q63173.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	FA82792-2 ug/l	Spike Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0097	J	0.0714	0.0778	94	0.0714	0.0767	92	1	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0721	96	0.0714	0.0725	97	1	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0723	98	0.0714	0.0678	91	6	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0045	J	0.0714	0.0679	92	0.0714	0.0694	94	2	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0729	100	0.0714	0.0704	96	3	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0683	96	0.0714	0.0671	94	2	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0695	97	0.0714	0.0705	99	1	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0701	98	0.0714	0.0680	95	3	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0716	100	0.0714	0.0686	96	4	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0608	85	0.0714	0.0448	63	30	60-140/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0677	95	0.0714	0.0676	95	0	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0758	106	0.0714	0.0691	97	9	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0745	104	0.0714	0.0739	103	1	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0677	95	0.0714	0.0713	100	5	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0710	99	0.0714	0.0766	107	8	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0714	0.0770	108	0.0714	0.0645	90	18	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0664	93	0.0714	0.0644	90	3	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0621	87	0.0714	0.0580	81	7	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0694	97	0.0714	0.0687	96	1	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0700	98	0.0714	0.0705	99	1	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0696	97	0.0714	0.0686	96	1	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0722	101	0.0714	0.0690	97	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0711	100	0.0714	0.0709	99	0	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0734	103	0.0714	0.0703	98	4	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0665	93	0.0714	0.0624	87	6	70-130/30
919005-14-4	ADONA	ND		0.0714	0.0620	87	0.0714	0.0607	85	2	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0633	89	0.0714	0.0644	90	2	60-140/30
763051-92-911	Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0659	92	0.0714	0.0665	93	1	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
	13C4-PFBA	68%	78%	76%	35-135%
	13C5-PFPeA	68%	77%	76%	50-150%
	13C5-PFHxA	64%	75%	73%	50-150%
	13C4-PFHpA	66%	76%	73%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MS	2Q63174.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
OP84056-MSD	2Q63175.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
FA82792-2 ^a	2Q63173.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
13C8-PFOA		68%	78%	77%	50-150%
13C9-PFNA		69%	81%	78%	50-150%
13C6-PFDA		70%	80%	81%	50-150%
13C7-PFUnDA		65%	79%	76%	40-140%
13C2-PFDoDA		59%	69%	69%	40-140%
13C2-PFTeDA		38%	20%*	17%* ^b	30-130%
13C3-PFBS		70%	80%	76%	50-150%
13C3-PFHxS		69%	76%	76%	50-150%
13C8-PFOS		66%	84%	88%	50-150%
13C8-FOSA		35%	27%*	21%* ^b	30-130%
d3-MeFOSAA		85%	98%	100%	40-140%
d5-EtFOSAA		79%	97%	95%	40-140%
13C2-4:2FTS		69%	80%	73%	50-150%
13C2-6:2FTS		78%	90%	83%	50-150%
13C2-8:2FTS		78%	94%	89%	50-150%
13C3-HFPO-DA		70%	86%	84%	50-150%

(a) Confirmation run.

(b) Outside control limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MS	2Q63436.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
OP84148-MSD	2Q63437.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
FA82792-2	2Q63435.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	Compound	FA82792-2 ug/l	Spike Q	ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0102		0.0714	0.0784	95	0.0714	0.0738	89	6	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0015	J	0.0714	0.0647	88	0.0714	0.0609	83	6	70-130/30
307-24-4	Perfluorohexanoic acid	0.0019		0.0714	0.0686	93	0.0714	0.0629	85	9	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0052		0.0714	0.0677	87	0.0714	0.0605	77	11	70-130/30
335-67-1	Perfluorooctanoic acid	0.0017	J	0.0714	0.0698	95	0.0714	0.0657	90	6	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0622	87	0.0714	0.0591	83	5	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0682	95	0.0714	0.0633	89	7	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0689	96	0.0714	0.0654	92	5	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0675	94	0.0714	0.0638	89	6	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0454	64	0.0714	0.0501	70	10	60-140/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0671	94	0.0714	0.0620	87	8	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0779	109	0.0714	0.0710	99	9	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0850	119	0.0714	0.0749	105	13	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0679	95	0.0714	0.0618	87	9	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0801	112	0.0714	0.0724	101	10	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0015	J	0.0714	0.0654	89	0.0714	0.0596	81	9	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0619	87	0.0714	0.0634	89	2	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0540	76	0.0714	0.0613	86	13	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0687	96	0.0714	0.0652	91	5	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0706	99	0.0714	0.0667	93	6	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0696	97	0.0714	0.0641	90	8	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0734	103	0.0714	0.0695	97	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0713	100	0.0714	0.0674	94	6	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0685	96	0.0714	0.0647	91	6	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0532	74	0.0714	0.0490	69*	8	70-130/30
919005-14-4	ADONA	ND		0.0714	0.0549	77	0.0714	0.0510	71	7	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0655	92	0.0714	0.0589	82	11	60-140/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0858	120	0.0714	0.0584	82	38*	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
	13C4-PFBA	53%	58%	56%	35-135%
	13C5-PFPeA	58%	62%	60%	50-150%
	13C5-PFHxA	58%	63%	59%	50-150%
	13C4-PFHpA	58%	63%	59%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: FA82792
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MS	2Q63436.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
OP84148-MSD	2Q63437.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
FA82792-2	2Q63435.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
13C8-PFOA		68%	73%	70%	50-150%
13C9-PFNA		79%	85%	79%	50-150%
13C6-PFDA		84%	96%	90%	50-150%
13C7-PFUnDA		68%	96%	86%	40-140%
13C2-PFDoDA		47%	100%	93%	40-140%
13C2-PFTeDA		37%	46%	67%	30-130%
13C3-PFBS		56%	61%	58%	50-150%
13C3-PFHxS		67%	75%	71%	50-150%
13C8-PFOS		88%	96%	90%	50-150%
13C8-FOSA		11%* a	17%* a	16%* a	30-130%
d3-MeFOSAA		70%	90%	83%	40-140%
d5-EtFOSAA		70%	101%	90%	40-140%
13C2-4:2FTS		52%	55%	50%	50-150%
13C2-6:2FTS		72%	77%	70%	50-150%
13C2-8:2FTS		98%	113%	101%	50-150%
13C3-HFPO-DA		75%	81%	80%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

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