



Austin Quinn-Davidson, Acting Mayor

2020 Stormwater Outfall Monitoring Report

APDES Permit No. AKS-052558

**MUNICIPALITY OF ANCHORAGE
WATERSHED MANAGEMENT PROGRAM**

FINAL REPORT

December 2020

2020 Stormwater Outfall Monitoring Report

APDES Permit No. AKS-052558

MUNICIPALITY OF ANCHORAGE
WATERSHED MANAGEMENT PROGRAM

Prepared for: Municipality of Anchorage
Project Management and Engineering Department
Watershed Management Services

Prepared by: HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, AK 99503

FINAL REPORT

December 2020

Table of Contents

1.0	Introduction	1
1.1	Background.....	1
1.2	Stormwater Definition.....	1
1.3	Monitoring Program Objectives	2
1.4	Report Organization.....	3
2.0	Program Description and Methodology.....	3
2.1	Monitoring Sites	3
2.2	Measured Parameters	7
2.3	Sampling Events.....	8
2.3.1	Sampling Events.....	13
2.4	Field Sampling Procedures	16
2.5	Sampling Handling and Chain of Custody Procedures.....	17
2.6	Laboratory Analyses	17
2.7	Deviation from the QAP	17
2.8	QA/QC and Data Validation	18
3.0	Results and Discussion	19
3.1	Field Measurements	19
3.2	Conventional Parameters (BOD5 and TSS).....	28
3.3	Fecal Coliform.....	29
3.4	Metals and Hardness	31
3.5	Hydrocarbons	35
3.6	Multi-Year Site Trends	41
3.7	Seasonal and Yearly Trends.....	50
3.8	Annual Loading.....	52
4.0	Summary and Conclusions.....	55
5.0	References.....	56

Tables

Table 1. Outfalls Sampled under the Stormwater Outfall Monitoring Program, 2011 - 2020	5
Table 2. Sample Type, Measurement Type, and Method of Analysis for Measured Parameters	7
Table 3. Parameters Measured at each Selected Outfall	8
Table 4. Precipitation Recorded During and Prior to Sampling Events (measured per Calendar Day)	14
Table 5. Precipitation Data for Each Sampling Event Presented on a 24-Hour Basis	15
Table 6. <i>In situ</i> Parameters Measured at Monitoring Sites during All Four Sampling Events	23
Table 7. Concentrations of Microbiological and Conventional Parameters	26
Table 8. Concentrations of Hardness and Dissolved Copper	33
Table 9. Hydrocarbon Concentrations Measured in Stormwater at Four Sites during All Four Storm Events	37
Table 10. Pertinent Numeric Alaska Water Quality Standard (AWQS) Criteria	38

Figures

Figure 1: Overview Map of Outfall Monitoring Sites and Subbasins	6
Figure 2. 2020 Monitoring Period and Cumulative Precipitation at the PANC Weather Station	9
Figure 3. 2020 Monthly Precipitation Measured at the PANC Weather Station Compared to Normal	10
Figure 4. Rainfall Measured at the Spencer and Lynwood Rain Gauges, by Calendar Day	11
Figure 5. Rainfall Measured at the Nunaka and Thomas Rain Gauges, by Calendar Day	12
Figure 6. Flow Rates Measured at Monitoring Sites during All Four Events	20
Figure 7. Turbidity Measured in Stormwater Sampled at Monitoring Sites during All Four Events	20
Figure 8. Dissolved Oxygen Measured in Stormwater Sampled at Monitoring Sites during All Four Events	21
Figure 9. Total Dissolved Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events	21
Figure 10. pH Measured in Stormwater Sampled at Monitoring Sites during All Four Events	22
Figure 11. Temperature (°C) Measured in Stormwater Sampled at Monitoring Sites during All Four Events	22
Figure 12. BOD ₅ (mg/L) Measured in Stormwater Sampled at Monitoring Sites during All Four Events ...	30
Figure 13. Total Suspended Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events	30

Figure 14. Fecal Coliform (FC/100 mL) Measured in Stormwater Sampled at Monitoring Sites during All Four Events	31
Figure 15. Water Hardness (mg/L) Measured in Stormwater Samples	34
Figure 16. Dissolved Copper ($\mu\text{g/L}$) Measured in Stormwater Samples	34
Figure 17. Total Aqueous Hydrocarbons Measured in Stormwater Sampled at Monitoring Sites during All Four Events	35
Figure 18. Station Box Plot of Temperature by Outfall, All Data 2011 through 2020	41
Figure 19. Station Box Plot of Dissolved Oxygen by Outfall, All Data 2011 through 2020	42
Figure 20. Station Box Plot of pH by Outfall, All Data 2011 through 2020	43
Figure 21. Station Box Plot of Total Dissolved Solids by Outfall, All Data 2011 through 2020	44
Figure 22. Station Box Plot of Total Suspended Solids by Outfall, All Data 2011 through 2020	45
Figure 23. Station Box Plot of Turbidity by Outfall, All Data 2011 through 2020	45
Figure 24. Station Box Plot of BOD ₅ by Outfall, All Data 2011 through 2020	46
Figure 25. Station Box Plot of Fecal Coliform Bacteria by Outfall, All Data 2011 through 2020	47
Figure 26. Station Box Plot of Flow Rate by Outfall, All Data 2011 through 2020	48
Figure 27. Station Box Plot of Hardness by Outfall, All Data 2016 through 2020	49
Figure 28. Station Box Plot of Dissolved Copper by Outfall, All Data 2016 through 2020	49
Figure 29. Seasonal Patterns for Temperature, DO, and Fecal Coliform, All Sites and All Years.	51
Figure 30. Fecal Coliform Annual Loading by Monitoring Site	53
Figure 31. Hydrocarbon Annual Loading by Monitoring Site	53

Appendices

Appendix A	Outfall Site Maps
Appendix B	Photographs
Appendix C	Laboratory Data Packages and Chain of Custodies
Appendix D	Field and Laboratory Data Validation
Appendix E	Field Logs

List of Acronyms

°C	Degrees Celsius
%	Percent
µg/L	Micrograms/Liter
ADEC	Alaska Department of Environmental Conservation
APDES	Alaska Pollutant Discharge and Elimination System
AWC	Anchorage Waterways Council
AWQS	Alaska Water Quality Standard
BTEX	Benzene, Ethylbenzene, Toluene, and Xylenes
BMPs	Best Management Practices
BOD ₅	Biochemical Oxygen Demand (5 Day)
COC	Chain of Custody
CI	Commercial Industrial
Cu	Copper
CWA	Clean Water Act
DO	Dissolved Oxygen
DOT&PF	Alaska Department of Transportation and Public Facilities
DOY	Day of Year
EPA	U.S. Environmental Protection Agency
FC/100 mL	Fecal Coliform units per 100 Milliliters
gpm	Gallons per Minute
Hr or Hrs	Hour or Hours
HGDB	Hydro-Geographic Database
L	Liter
LCS/LCSD	Laboratory Control Samples and Duplicates
mL	Milliliter
mg/L	Milligrams/Liter
MOA	Municipality of Anchorage
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MS4	Municipal Separate Storm Sewer System
NADP	National Atmospheric Deposition Program
ND	Not Detected
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units

Nunaka	Rain Gauge off Boniface Parkway between Debar and East Northern Lights Boulevard
OGS	Oil/Grit Separator
PAHs	Polycyclic Aromatic Hydrocarbons
PANC	NOAA National Weather Service Station at TSAIA
QA/QC	Quality Assurance/Quality Control
QAP	Monitoring, Evaluation, and Quality Assurance Plan
QC	Quality Control
SMRC	Stormwater Managers Resource Center.
Spencer	Rain Gauge at Elmore and Huffman Roads
SRMs	Standard Reference Material
TAqH	Total Aqueous Hydrocarbons
TAH	Total Aromatic Hydrocarbons
TDS	Total Dissolved Solids
Thomas	Rain Gauge at Lake Otis Parkway and Tudor Road
TMDL	Total Maximum Daily Load
TNTC	Too Numerous to Count
TPAH	Total Polycyclic Aromatic Hydrocarbons
TSAIA	Ted Stevens Anchorage International Airport
TSS	Total Suspended Solids
USGS	United States Geological Survey

1.0 Introduction

This report details the findings of the 2020 Municipality of Anchorage (MOA) stormwater monitoring program. This program satisfies the stormwater outfall monitoring requirements of the current Municipal Separate Storm Sewer System (MS4) permit (Permit No. AKS-052558) in compliance with the National Pollutant Discharge Elimination System (NPDES) established under the Clean Water Act (CWA).

1.1 Background

The U.S Environmental Protection Agency (EPA) first issued a MS4 permit to the MOA and the Alaska Department of Transportation and Public Facilities (DOT&PF) in 1999. EPA reissued the permit in 2009 with the additional requirement to conduct stormwater outfall monitoring throughout the Anchorage Bowl. After reissuance of the permit, EPA delegated the NPDES stormwater program to the Alaska Department of Environmental Conservation (ADEC), which now oversees its implementation and administration within the state as part of the Alaska Pollutant Discharge Elimination System (APDES). ADEC reissued the MS4 permit in 2015 and in 2020, maintaining the requirement for stormwater outfall monitoring.

The Anchorage MS4 permit establishes control measures requiring the co-permittees to develop programs designed to prevent contaminants from entering the storm sewer system. The permit also identifies monitoring objectives, including stormwater outfall monitoring (Section 4.1.7 of the MS4 permit). The MOA has taken the lead role in administering the stormwater outfall monitoring program (SWM Program). The MS4 permit requires the selection of 10 priority outfall locations for stormwater monitoring that represent a variety of major land use areas within the Anchorage Bowl. It also requires selected outfall locations to be sampled four times each year during storm events that meet specific criteria for a designated set of physical and chemical parameters. Stormwater sampling conducted during 2020 represents the fifth and final year of monitoring under the 2015 MS4 permit and the tenth year of monitoring selected outfalls during storm events.

This report and the data collected under the SWM Program fulfill the annual outfall monitoring objectives of the MS4 permit. The previous permit expired on July 31, 2020 and a new permit went into effect on August 1, 2020 and will expire on July 31, 2025.

1.2 Stormwater Definition

Urban stormwater is a major contributor of pollution to the nation's waterways (EPA 1983). Precipitation and snowmelt events cause runoff that can transport urban contaminants into streams, rivers, and lakes. The runoff from impermeable surfaces such as roads, driveways, and sidewalks, as well as from semi-permeable surfaces such as golf courses, lawns, and gardens can carry a variety of pollutants through the storm sewer, generally discharging directly into local waterways without treatment. The EPA and delegated states use the MS4 permit to control these pollutants and limit contamination of local waterbodies.

Section 303(d) of the CWA requires that States submit to EPA a list of impaired waterbodies and develop water quality management plans, in the form of Total Maximum Daily Loads (TMDLs) for

those waters. The current MS4 permit cites the 2010 EPA-approved list of impaired waters, which includes 13 waterbodies in the greater Anchorage area, as impaired for three pollutants of concern: fecal coliform bacteria, dissolved oxygen (DO), and petroleum products. The 2016 EPA-approved list of impaired waters identifies 11 Anchorage-area waterbodies as impaired for fecal coliform (ADEC 2018). These waterbodies include Campbell Creek, Campbell Lake, Chester Creek, Fish Creek, Furrow Creek, Little Campbell Creek, Little Rabbit Creek, Little Survival Creek, Ship Creek, University Lake, and Westchester Lagoon. ADEC has developed, and EPA has approved, TMDLs for fecal coliform for all 11 listed waterbodies. The TMDL implementation plans identify urban runoff as the major contributor of fecal coliform pollution and establish specific reduction goals to improve stormwater quality and reduce the resulting impact on receiving waters.

Since 2010, ADEC has updated the listings for Ship Creek and Hood/Spenard Lake. The petroleum products impairment was removed from Ship Creek in 2012, following monitoring that demonstrated that the analytical indicators for petroleum hydrocarbons were not present in sufficient concentrations to exceed water quality criteria. Ship Creek remains impaired for fecal coliform. Hood/Spenard Lake is no longer included on the Section 303(d) list of impaired waters. Following implementation of improved stormwater management practices and a waterfowl hazing program at the Ted Stevens Anchorage International Airport (TSAIA), water quality data has shown that Hood/Spenard Lake meets water quality criteria for fecal coliform and DO. The fecal coliform bacteria impairment was removed in 2010 and the DO impairment was removed in 2016.

1.3 Monitoring Program Objectives

The overarching objectives of the monitoring program established in the Anchorage MS4 permit are to characterize the quality of stormwater discharges from the MS4 and track the effectiveness of best management practices (BMPs) implemented as part of the TMDL implementation plans. The SWM Program aims to meet these objectives through continued monitoring of 10 outfalls through the permit term. The SWM Program meets the following objectives specified in the MS4 permit:

- Broadly estimate the annual stormwater loading of fecal coliform and petroleum products discharged into specific watersheds from the MS4
- Assess the effectiveness of existing stormwater controls in reducing fecal coliform bacteria and petroleum product contamination
- Identify and prioritize portions of the MS4 that need additional controls

As of 2018, no waterbody in the Anchorage MS4 permit area is included on the Section 303(d) list of impaired waters for petroleum product contamination (ADEC 2018). However, because petroleum products were identified as a contaminant of concern in the 2016 MS4 permit, and because stormwater runoff has the potential to transport petroleum products from a variety of sources, the stormwater outfall monitoring program continues to measure petroleum product contamination.

1.4 Report Organization

Section 2.0 of this report includes an overview of the SWM Program and provides background information regarding the outfall site selection process, the water quality parameters tested, and procedures followed as required by the MS4 permit. This section also details 2020 fieldwork conducted under the Program, including a discussion of the 2020 sampling events and the associated weather and precipitation data. Discussion of field-sampling procedures, sample handling and chain of custody, laboratory analyses, quality control, and data validation procedures is included.

Section 3.0 presents the results of the 2020 SWM Program, including tabular and graphical summaries of field measurements and lab data, as well as a discussion of results, site trends, yearly and seasonal trends, and annual loading from MS4 discharge.

Section 4.0 of the report presents a summary of findings as well as preliminary conclusions. References are included in Section 5.0. The body of the report is followed by appendices, which include site maps, field photographs, laboratory data reports, data validation summaries, and field log forms.

2.0 Program Description and Methodology

The SWM Program was developed to meet the MS4 permit requirements and is defined in the *Monitoring, Evaluation, and Quality Assurance Plan* (QAP) for the MS4 permit (MOA 2016). Appendix B of the QAP, *Stormwater Outfall Monitoring Plan* specifically details the SWM Program, including the program design rationale, sampling methodology and protocols, field team training requirements, and results to be presented in the annual report.

2.1 Monitoring Sites

Per the requirements of the MS4 permit, the *Stormwater Outfall Monitoring Plan* includes a list of 30 outfalls prioritized as high and medium priority monitoring locations. The MOA developed the list to meet the requirements of the 2009 MS4 permit.

The methodology used to define the monitoring corridor and identify and prioritize the outfalls is described in the QAP (MOA 2016). Under the 2009 MS4 permit, the MOA selected and ranked 30 subbasins within a targeted area of the Anchorage Bowl for inclusion in the SWM Program (MOA 2011). Selected subbasins include those zoned for a single predominant land use, subbasins zoned for mixed land uses, and subbasins with and without oil and grit separator (OGS) devices. These subbasins were then ranked based on the area of impervious surface directly connected to the storm drain system leading to the outfall, access to the outfall, and accessibility of the outfall from legal parking.

The SWM Program began in 2011 with ten priority outfalls selected for sampling. To facilitate sample labeling and simplify outfall identification in the field, the outfalls were sequentially numbered from south to north along the monitoring corridor (SWM01 through SWM10).

Two outfalls, SWM01 and SWM02, were sampled from 2011 through 2016. However, these outfalls were replaced in 2017. SWM01 was discontinued due to inconsistent flow and the small

size of the drainage area. The replacement outfall, SWM11, also drains a residential land use subbasin and has a larger drainage area than SWM01. SWM02 was discontinued when it was determined that the outfall is not truly representative of the contributing land use area as a result of influence of streamflow from Little Campbell Creek. SWM02 was replaced with SWM12, which also drains a commercial and industrial land use subbasin. SWM11 and SWM12 were not included on the original list of 30 prioritized subbasins, but were selected because their location in the monitoring corridor and the characteristics of their subbasins are similar to those of SWM01 and SWM02.

SWM03 and SWM04 are located near Sylvan Drive and drain a residential area east of Campbell Creek. Though these outfalls are close together, SWM03 has a far larger drainage area. SWM05 is located at the end of East 56th Avenue and drains a commercial and industrial area south of International Airport Road and east of C Street. SWM06 is located at the end of Maplewood Street and drains a residential area north of Northern Lights Boulevard. SWM07 and SWM08 are located at the Seward Highway where Chester Creek passes beneath the highway. They drain a commercial and industrial area north of the creek and a mixed land use area south of the creek, respectively. SWM09 is located near the Anchorage Football Stadium and drains the area around Ben Boeke and Sullivan Arenas. SWM10 is located at the end of Eagle Street and drains a mixed commercial and residential area south of Chester Creek. SWM11 is located at Johns Road and Botanical Circle and drains a large residential area north of Furrow Creek. SWM12 drains a commercial and industrial area near the Old Seward Highway and represents the inflow to the Lynwood retention basin.

Table 1 presents the characteristics of the outfalls sampled under the SWM Program, including physical location, geographic location, outfall dimensions, acreage of subbasin, and percent impervious surface of the subbasin. Figure 1 shows the locations of the 10 currently monitored outfalls and subbasins within the monitoring corridor. Figure 1 also shows the locations of four tipping bucket rain gauges installed along the monitoring corridor in 2020. Detailed site maps showing the outfalls and the land use types of the contributing subbasins are included as Appendix A.



Table 1. Outfalls Sampled under the Stormwater Outfall Monitoring Program, 2011 - 2020

Station ID	Subbasin ID	Outfall Node ID	Watershed	Contributing Land Use	OGS Present	Priority Rank ^a	Latitude	Longitude	Outfall Diameter (inches)	Subbasin Area (acres)	Subbasin Percent Impervious
SWM01	1040b	1040-3	Little Campbell	Residential	No	10	61° 07.526'	-149° 50.196'	18	91.38	36
SWM02	1210	847-1	Little Campbell	Commercial and Industrial	No	17	61° 08.665'	-149° 50.797'	18	37.17	82
SWM03	1224a	1224-1	Campbell	Residential	Yes	3	61° 09.548'	-149° 52.443'	36	92.78	70
SWM04	1224b	1224-2	Campbell	Residential	Yes	6	61° 09.545'	-149° 52.451'	18	20.10	32
SWM05	805	207-1	Campbell	Commercial and Industrial	Yes	1	61° 10.202'	-149° 52.326'	24	58.34	75
SWM06	219	314-22	Chester	Residential	Yes	2	61° 11.996'	-149° 50.750'	24	33.81	37
SWM07	507	484-1	Chester	Commercial and Industrial	No	8	61° 12.100'	-149° 52.114'	24	50.17	83
SWM08	549	86-1	Chester	Mixed	No	6	61° 12.095'	-149° 52.114'	42	354.62	69
SWM09	132	499-1	Chester	Commercial and Industrial	Yes	4	61° 12.176'	-149° 52.554'	24	40.04	54
SWM10	554	525-2	Chester	Mixed	No	5	61° 12.161'	-149° 52.486'	24	47.51	75
SWM11	1103	348-3	Furrow	Residential	No	-	61° 06.448'	-149° 52.734'	36	86.32	39
SWM12	1449	1454-1	Campbell	Commercial and Industrial	No	-	61° 09.758'	-149° 52.525'	24	111.68	60

Note: Stations highlighted in red were sampled from 2011 through 2016. Stations highlighted in yellow were added to the SWM Program in 2017 to replace SWM01 and SWM02.

^aMOA 2011

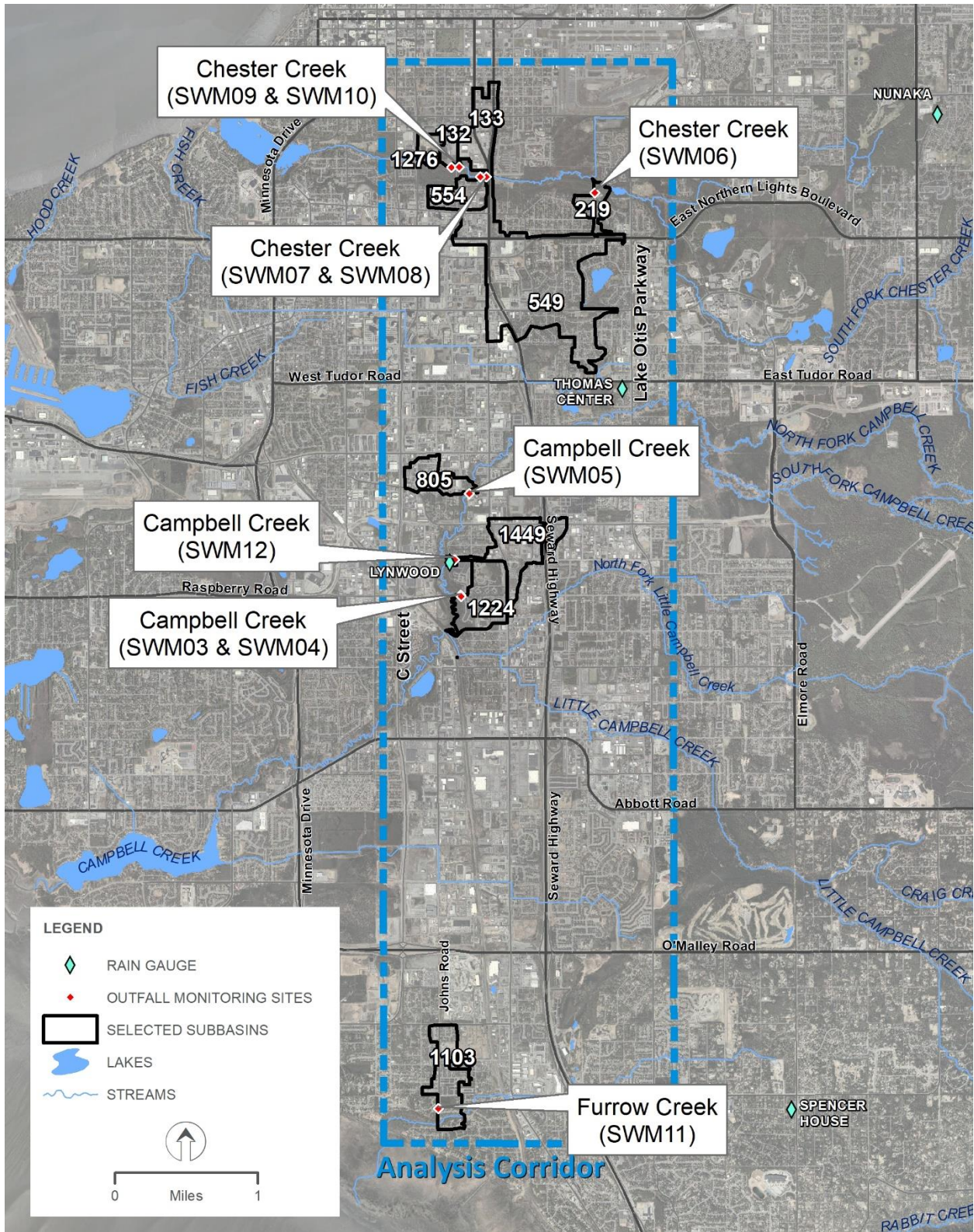


Figure 1: Overview Map of Outfall Monitoring Sites and Subbasins.

Detailed maps of each subbasin are provided in Appendix A.



2.2 Measured Parameters

Monitoring of the selected outfalls includes both *insitu* measurements and discrete grab samples submitted for laboratory analyses. Table 2 lists parameters measured under the MS4 SWM Program, including sample type, measurement type, analysis method, and purpose of monitoring. Measurement quality objectives for each parameter including precision, accuracy, sensitivity, and measurement range are included in the QAP. In addition to the parameters listed in Table 2, field observations are recorded at each outfall including evidence of oily sheen, scum, odor, detritus, floating material, water color and clarity, deposits or stains, vegetation, and other pertinent observations.

Table 2. Sample Type, Measurement Type, and Method of Analysis for Measured Parameters

Parameter	Sample Type ^a	Measurement Type	Analysis Method	Purpose
Flow	IR	Field	Flow meter, or bucket	Characterize flow & loading
Specific Conductivity	IR	Field	EPA 120.1/ YSI 556/Pro Plus	Stormwater quality
Dissolved Oxygen (DO)	IR	Field	EPA 360.1/ YSI 556/Pro Plus	Stormwater quality
pH	IR	Field	EPA 150.2/ YSI 556/Pro Plus	Stormwater quality
Temperature	IR	Field	SM2550B/ YSI 556/Pro Plus	Stormwater quality
Turbidity	IR/G	Field	EPA 180.1/ Hach 2100	Stormwater quality
5-Day Biochemical Oxygen Demand (BOD ₅)	G	Laboratory	SM 5210 B	Stormwater quality
Fecal Coliform	G	Laboratory	SM 9222D	Stormwater quality & loading
Total Suspended Solids (TSS)	G	Laboratory	SM 2540D	Stormwater quality
Total Aromatic Hydrocarbons (TAH)	G	Laboratory	EPA 624	Stormwater quality & loading
Total Aqueous Hydrocarbons (TAqH)	G	Laboratory	EPA 625 + EPA 624	Stormwater quality & loading
Dissolved Copper ^b	G	Laboratory	EPA 200.8	Stormwater quality
Total Hardness ^b	G	Laboratory	EPA 200.8	Stormwater quality

^a IR = instantaneous recording of field analysis; G = grab sample for analysis

^b Dissolved copper and total hardness were added to the SWM Program in 2016.

Table 3 identifies the parameters monitored at each selected outfall. Only samples from outfalls located in predominantly commercial and industrial land use areas are analyzed for hydrocarbon concentrations. This includes measurements of total aromatic hydrocarbons (TAH) and polycyclic aromatic hydrocarbons (PAH), which provide the basis for calculation of total aqueous hydrocarbons (TAqH). Outfalls with watersheds dominated by commercial and industrial land uses are those most likely to contribute petroleum hydrocarbon pollutants to receiving waters. To assess the effectiveness of existing BMPs in improving stormwater quality and reducing petroleum hydrocarbon concentrations, the SWM Program samples two outfalls within



commercial and industrial subbasins that contain OGS systems, and two that do not have OGS systems.

Table 3. Parameters Measured at each Selected Outfall

Station ID	Watershed	Contributing Land Use	OGS Present?	Field Parameters						Lab Samples						
				Flow	Conductivity	pH	Temperature	DO	Turbidity	BOD ₅	Fecal Coliform	TSS	Hardness	Dissolved Cu	TAH	PAH
SWM03	Campbell	Residential	Yes	x	x	x	x	x	x	x	x	x	x	x		
SWM04	Campbell	Residential	Yes	x	x	x	x	x	x	x	x	x	x	x		
SWM05	Campbell	Commercial and Industrial	Yes	x	x	x	x	x	x	x	x	x	x	x	x	x
SWM06	Chester	Residential	Yes	x	x	x	x	x	x	x	x	x	x	x		
SWM07	Chester	Commercial and Industrial	No	x	x	x	x	x	x	x	x	x	x	x	x	x
SWM08	Chester	Mixed	No	x	x	x	x	x	x	x	x	x	x	x		
SWM09	Chester	Commercial and Industrial	Yes	x	x	x	x	x	x	x	x	x	x	x	x	x
SWM10	Chester	Mixed	No	x	x	x	x	x	x	x	x	x	x	x		
SWM11	Furrow	Residential	No	x	x	x	x	x	x	x	x	x	x	x		
SWM12	Campbell	Commercial and Industrial	No	x	x	x	x	x	x	x	x	x	x	x	x	x

* DO = dissolved oxygen; BOD₅: 5-day biochemical oxygen demand; TSS: total suspended solids; TAH: total aromatic hydrocarbons; TAqH: total aqueous hydrocarbons

2.3 Sampling Events

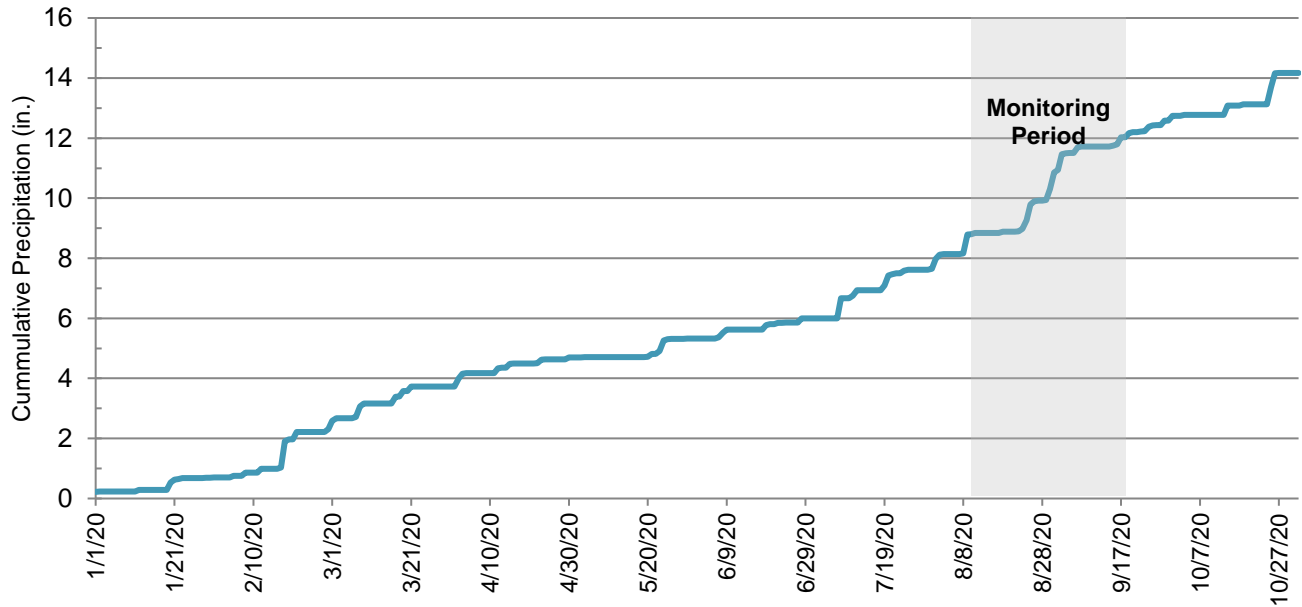
The SWM Program measures pollutants and pollutant indicators in stormwater at the 10 selected outfalls four times each summer. Sampling events are triggered by storms that generate 0.1 inches of precipitation or greater in 24 hours and are preceded by a period of 24 hours with less than 0.1 inches of precipitation. Rainfall at the National Weather Service (NWS 2020a) mesonet KTUU-midtown weather station was monitored to determine whether a rainfall event provided sufficient precipitation to trigger a sampling event. This weather station is centrally located in the monitoring corridor and provides a good representation of active precipitation that would produce runoff at the sites. The weather station website updates every five minutes with the latest precipitation amount and displays 72-hours' worth of data with a 24-hour running precipitation total. The KTUU-midtown weather station is monitored to trigger sampling events due to its central location and availability of real-time precipitation data.

Four stormwater outfall monitoring events were conducted in 2020 as required by the MS4 permit. The 2020 monitoring period began on August 11 and concluded on September 17. Sampling events took place on August 11, August 24, August 31, and September 17. Approximately 7.7 inches of precipitation (including snow, reported as water equivalent) had been measured in 2020 at the TSAIA PANC weather station before the first event was sampled. The PANC weather



station has the longest record of measurements for the Anchorage Bowl and is considered the official station for the MOA. While not located in the monitoring corridor and not used to trigger individual monitoring events, the PANC weather station provides the best available data record for analyzing long-term trends. The monitoring period is shown in conjunction with the cumulative annual precipitation recorded at the TSAIA PANC weather station in Figure 2.

Figure 2. 2020 Monitoring Period and Cumulative Precipitation (in. of water) at the PANC Weather Station

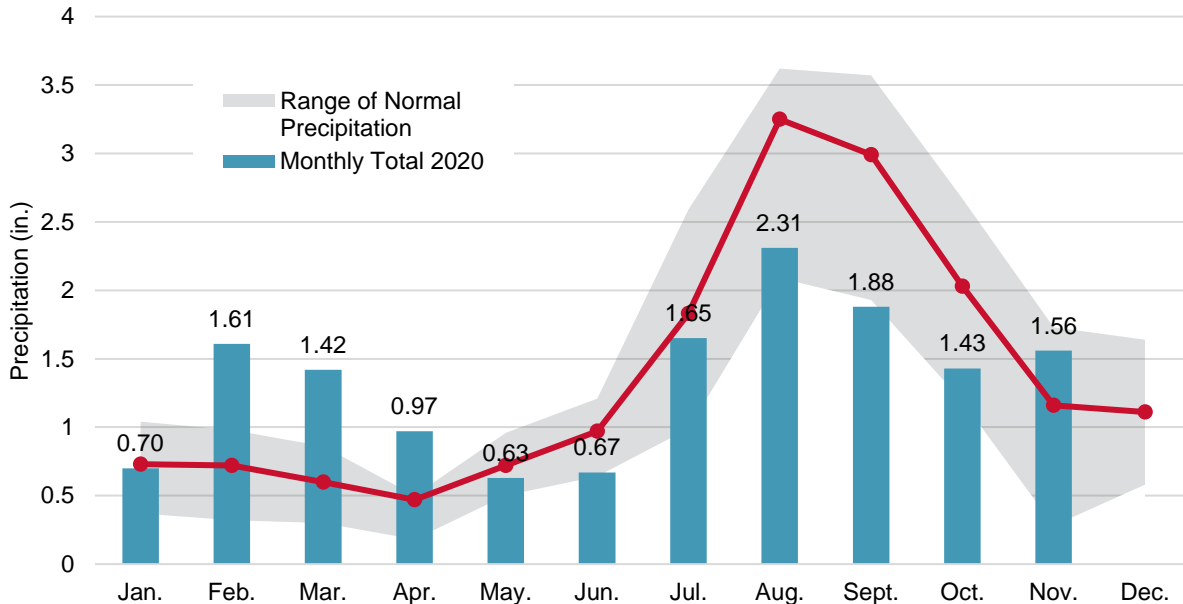


Source: NOAA 2020 and NWS 2020b.

Precipitation amounts for 2020 trended higher than the long-term average early in the year (February, March, April), lower during the sampling period (May through October), and again higher at the end of the year (November). At the end of September 2020, the cumulative precipitation was 11.84 inches. When compared to the long-term average of 12.28 inches, it shows 2020 precipitation in Anchorage is near average when compared to the historical record.

During the sampling period, Anchorage received below average rainfall. For August, the recorded rainfall of 2.31 inches was below the long-term average of 3.25 inches. For September, the recorded rainfall of 1.88 inches was below the long-term average of 2.99 inches. Even with the lower than average rainfall during the sampling period, the highest monthly precipitation for the year still occurred in August. The rainfall recorded in 2020 at the PANC weather station compared to historical precipitation data is shown in Figure 3.

Figure 3. 2020 Monthly Precipitation Measured at the PANC Weather Station Compared to Normal



Note: Normal range of precipitation shown is the range between the 25th and 75th percentiles of monthly precipitation averages recorded at the PANC weather station for the 30-year period from 1981 to 2010. Source: NOAA 2016 and NWS 2020b.

Four tipping bucket rain gauges installed within the monitoring area recorded precipitation throughout the monitoring period. The rain gauges were located along the monitoring corridor in order to provide a representation of the actual rainfall within the sampled subbasins. During precipitation events, the collection bucket in the gauge collects precipitation until it reaches the equivalent of 0.01 inch of precipitation whereupon the bucket tips, triggering a reed switch and recording an event with a time stamp. These events are stored in a data logger and downloaded into a computer program where they are summarized over different time intervals or graphed as a time series. The gauges were located off Boniface Parkway between Debarr and East Northern Lights Boulevard (“Nunaka”), near Lake Otis Parkway and Tudor Road (“Thomas”), at the Lynwood Retention Basin at SWM12 (“Lynwood”), and in South Anchorage near Elmore and Huffman Roads (“Spencer”) and represent the northern, middle, and southern portions of the study area respectively. Locations of the rain gauges installed in 2020 are shown on Figure 1. Daily rainfall records for the rain gauges are shown in Figure 4 and Figure 5.

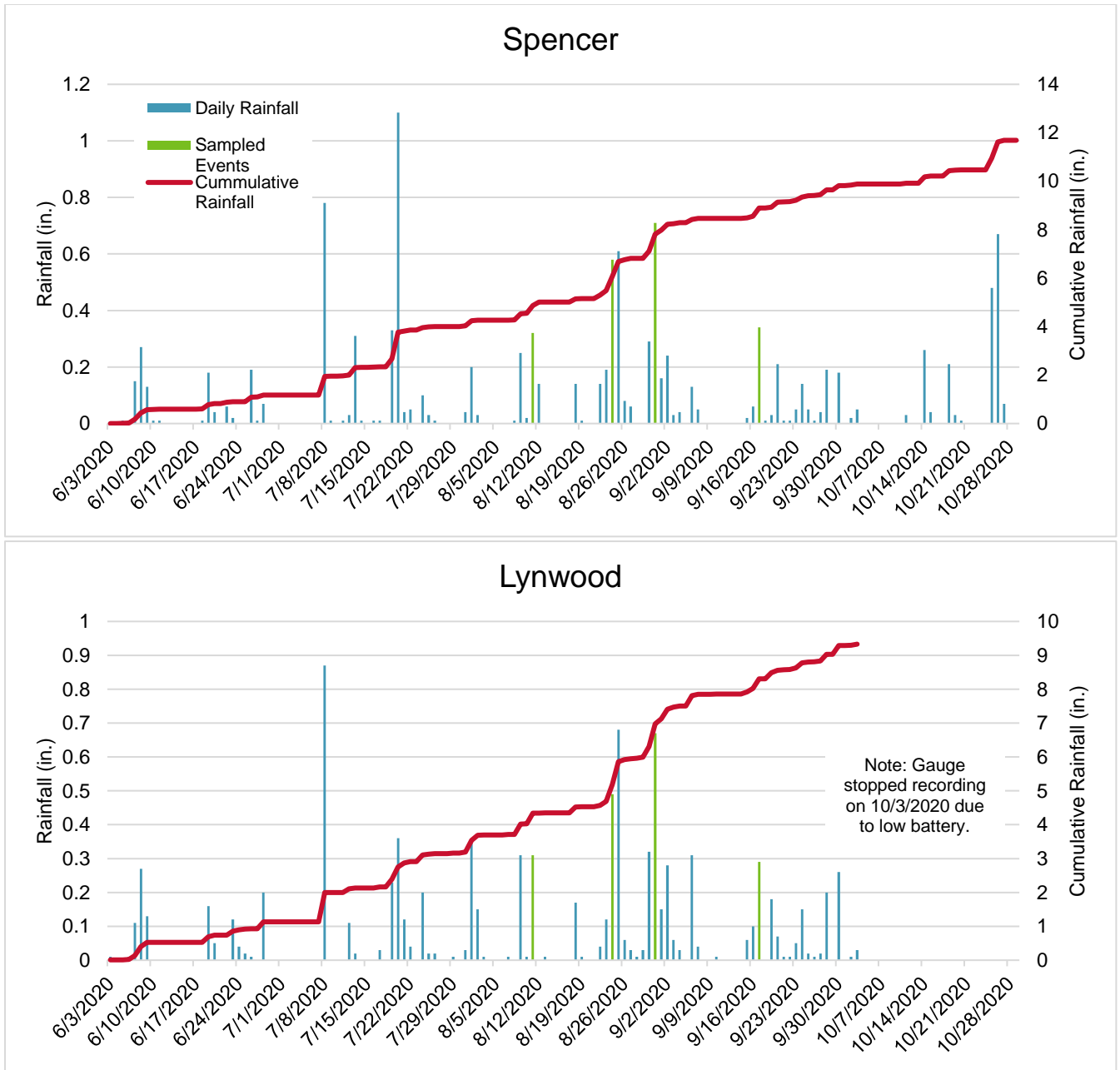


Figure 4. Rainfall Measured at the Spencer and Lynwood Rain Gauges, by Calendar Day

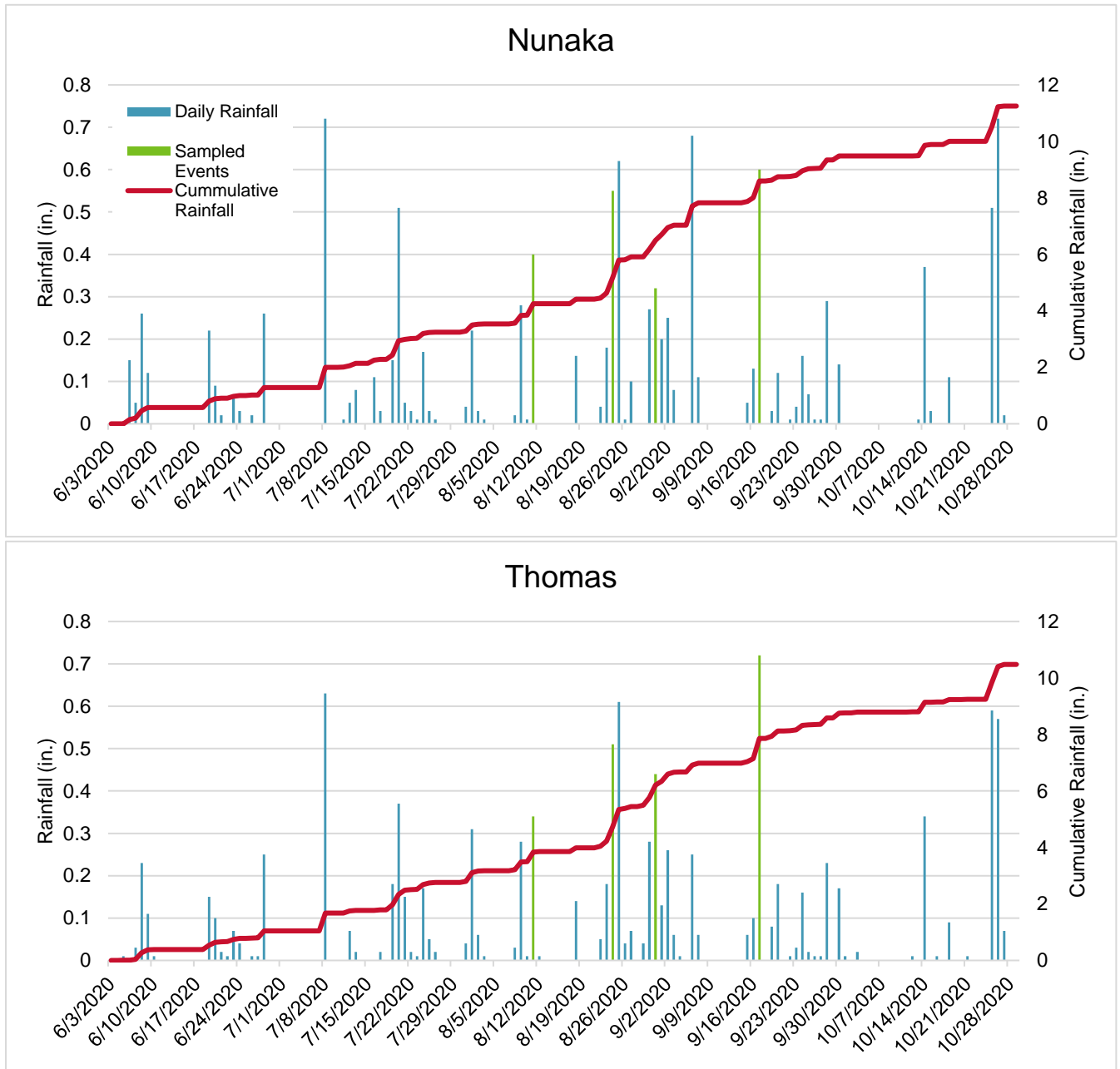


Figure 5. Rainfall Measured at the Nunaka and Thomas Rain Gauges, by Calendar Day

Actual rainfall during a single storm event can vary in different locations across the Anchorage Bowl. As in previous years, rainfall data from the PANC weather station were used to supplement the data collected at the rain gauges to provide a time series of rainfall prior to and during the sampled storm events. However, these values can vary from the KTUU-midtown weather station, which is used to determine whether a rainfall event provides sufficient precipitation to trigger a sampling event. The KTUU-midtown weather station only keeps a rolling 72-hour record of data.

Therefore, rain gage and PANC rainfall data for each sampling event is presented on a calendar-day basis in Table 4 and demonstrates considerable variability in the geospatial distribution of precipitation throughout the monitoring corridor.

The QAP defines storm events on a 24-hour storm basis rather than a calendar-day basis, as storms often commence in the late evening. All four storm events met the criteria of exhibiting greater than 0.1 inch of rain in 24 hours. Sampling for each storm event was completed within 24 hours from the start of a storm. In all sampling events, precipitation recorded at the four rain gauges during the preceding 24-hour period was generally less than 0.1 inches. Based on these data, all four storms that were sampled were considered to have met storm event criteria. Table 5 presents rainfall data for each sampling event on a 24-hour basis (as opposed to a calendar day basis).

2.3.1 Sampling Events

The first storm event sampled as part of the 2020 SWM Program occurred on August 11 (Storm 1). Sampling was initiated at 09:10, approximately six hours after the beginning of the storm and was completed by 13:15. Between 0.31 and 0.40 inches of rain fell across the monitoring corridor, measured by the rain gauges, from the beginning of the storm to the conclusion of sampling. The total 24-hour storm precipitation across the Anchorage Bowl ranged between 0.04 and 0.40 inches. The August 11 event was the smallest storm sampled during the 2020 SWM Program.

The second sampled storm event occurred on August 24 (Storm 2). Sampling was initiated at 09:00, approximately 11 hours after the beginning of the storm and was completed by 13:10. Between 0.39 and 0.54 inches of rain fell across the monitoring corridor, measured by the rain gauges, from the beginning of the storm to the conclusion of sampling. The total 24-hour storm precipitation across the Anchorage Bowl ranged between 0.29 and 0.58 inches.

The third sampled storm event occurred on August 31 (Storm 3). Sampling was initiated at 09:10, approximately 14 hours after the beginning of the storm and was completed by 12:55. Between 0.53 and 0.77 inches of rain fell across the monitoring corridor, measured by the project rain gauges, from the beginning of the storm to the conclusion of sampling. The total 24-hour storm precipitation across the Anchorage Bowl ranged between 0.32 and 0.77 inches. The August 31 event was the largest storm sampled during the 2020 SWM Program.

The fourth sampled storm event occurred on September 17 (Storm 4). Sampling was initiated at 09:10, approximately 11 hours after the beginning of the storm and was completed by 13:00. Between 0.29 and 0.72 inches of rain fell across the monitoring corridor, measured by the project rain gauges, from the beginning of the storm to the conclusion of sampling. The total 24-hour storm precipitation across the Anchorage Bowl ranged between 0.24 and 0.72 inches.



Table 4. Precipitation Recorded During and Prior to Sampling Events (measured per Calendar Day)

	Date	PANC Airport	Lynwood	Nunaka	Spencer	Thomas
		(in.)	(in.)	(in.)	(in.)	(in.)
	8/4/2020	0	0	0	0	0
	8/5/2020	0	0	0	0	0
	8/6/2020	0	0	0	0	0
	8/7/2020	0	0.01	0	0	0
	8/8/2020	0.02	0	0.02	0.01	0.03
	8/9/2020	0.63	0.31	0.28	0.25	0.28
	8/10/2020	0.01	0.01	0.01	0.02	0.01
Event 1	8/11/2020	0.04	0.31	0.40	0.32	0.34
≡						
	8/17/2020	0	0	0	0	0
	8/18/2020	0.04	0.17	0.16	0.14	0.14
	8/19/2020	0	0.01	0	0.01	0
	8/20/2020	0	0	0	0	0
	8/21/2020	0	0	0	0	0
	8/22/2020	0.02	0.04	0.04	0.14	0.05
	8/23/2020	0.08	0.12	0.18	0.19	0.18
Event 2	8/24/2020	0.29	0.49	0.55	0.58	0.51
	8/25/2020	0.52	0.68	0.62	0.61	0.61
	8/26/2020	0.11	0.06	0.01	0.08	0.04
	8/27/2020	0.02	0.03	0.1	0.06	0.07
	8/28/2020	0	0.01	0	0	0
	8/29/2020	0.02	0.03	0	0	0.04
	8/30/2020	0.36	0.32	0.27	0.29	0.28
Event 3	8/31/2020	0.56	0.67	0.32	0.71	0.44
≡						
	9/10/2020	0	0.01	0	0	0
	9/11/2020	0	0	0	0	0
	9/12/2020	0	0	0	0	0
	9/13/2020	0	0	0	0	0
	9/14/2020	0	0	0	0	0
	9/15/2020	0.03	0.06	0.05	0.02	0.06
	9/16/2020	0.04	0.1	0.13	0.06	0.1
Event 4	9/17/2020	0.24	0.29	0.60	0.34	0.72



Table 5. Precipitation Data for Each Sampling Event Presented on a 24-Hour Basis

	<u>Conclusion of Sampling</u>	<u>Time Period</u>	<u>Time Period Range</u>	<u>Rainfall Measured (Inches)</u>			
				<u>Lynwood</u>	<u>Nunaka</u>	<u>Spencer</u>	<u>Thomas</u>
		Preceding 24 hours	00:00 8/10 to 23:59 8/10	0.01	0.01	0.02	0.01
<u>Event 1</u>	08/11/2020 at 13:15	24 Hour Storm Period	00:00 8/11 to 23:59 8/11	0.31	0.40	0.32	0.34
		Preceding 24 hours	13:10 8/22 to 13:10 8/23	0.04	0.05	0.15	0.06
<u>Event 2</u>	08/24/2020 at 13:10	24 Hour Storm Period	13:10 8/23 to 13:10 8/24	0.39	0.54	0.51	0.45
		Preceding 24 hours	12:55 8/29 to 12:55 8/30	0.04	0.00	0.00	0.05
<u>Event 3</u>	08/31/2020 at 12:55	24 Hour Storm Period	12:55 8/30 to 12:55 8/31	0.74	0.53	0.77	0.57
		Preceding 24 hours	00:00 9/16 to 23:59 9/16	0.10	0.13	0.06	0.10
<u>Event 4</u>	09/17/2020 at 13:00	24 Hour Storm Period	00:00 9/17 to 23:59 9/17	0.29	0.60	0.34	0.72

2.4 Field Sampling Procedures

Sampling procedures were carried out in accordance with the methodology outlined in the QAP. No changes from previous years' sampling procedures were required in 2020.

Sampling bottles were prepared before the storm season so that field team could quickly mobilize for sampling. Bottles were labeled with station location, sample number, number of bottles, and analysis type and method. Once a storm event was identified for sampling, the field team prepared sampling equipment. Portable water quality measurement instrumentation was calibrated immediately prior to going in the field for each event per the manufacturer's recommendation as outlined in Appendix H of the QAP. Date, time, and sampler's initials were recorded on each sample bottle in the field at the time of sampling.

The field team consisted of two people for safety and allowed separate field role designations. One person would record the field measurements and notes while the second person performed measurements and conducted grab sampling. Upon arrival at the outfall, the field team conducted flow measurements and placed the YSI 556 or YSI Professional (Pro) Plus multi-probe into the outfall flow to allow the probes to equilibrate for at least two minutes prior to taking measurements.

An acoustic doppler flow meter and wading rod were used to collect flow measurements. The flow meter measures the average velocity of the outfall pipe over a twenty second period. The average velocity was used in conjunction with the water depth and pipe diameter to calculate the instantaneous flow of each outfall.

After measuring flow, the field team used the YSI multi-probe to measure DO, specific conductivity, pH, and temperature. Turbidity was measured in the field by collecting a discrete sample that was analyzed on site with a portable Hach 2100P/Q turbidimeter. Water quality measurements were obtained from the water flowing out of the end of pipe prior to any mixing within the receiving waterbody. Field measurements were recorded on project-specific field log forms that were bound in the project field logbooks along with field instrument calibration logs (refer to Appendix E).

The field team obtained water samples for BOD₅, TSS, fecal coliform, dissolved copper, total hardness, TAH, and PAH in pre-cleaned laboratory-provided bottles. The water quality samples were collected from the water flowing from the outfall, and extra care was taken not to disturb accumulated sediment in the outfall pipe when collecting a water sample. To avoid having to perform decontamination procedures, all samples, with the exception of TAH, were collected directly into their respective sample containers. In the case of TAH, the sample was first collected into a pre-cleaned and certified 250-milliliter (mL) PAH bottle that was then used to carefully fill the 40-milliliter (mL) vials for TAH analyses. The PAH bottle was then topped off with additional water from the outfall discharge. Since the PAH bottles were pre-cleaned and certified, it was unnecessary to perform equipment rinsate analyses. Once the water samples were collected, the field team recorded visual observations at each outfall location.

The field team conducted replicate field measurements and laboratory analyses at a rate of 15 percent (%) per sampling event. This resulted in replicate field measurements being taken at two monitoring sites per sampling event for all parameters except TAH and PAH. TAH and PAH

required one replicate field measurement since they are collected at fewer outfalls. TAH analyses also included a trip blank sample, provided by the laboratory that accompanied the sample bottles in the field. Additional water for BOD₅, TSS, dissolved copper, TAH, and PAH was collected at one station to allow the laboratory to perform matrix spike/matrix spike duplicate (MS/MSD) analyses.

2.5 Sampling Handling and Chain of Custody Procedures

BOD₅, TSS, fecal coliform, dissolved Cu, hardness, TAH, and PAH samples were collected, preserved, and cooled for delivery to the laboratory as described in the QAP. SGS is located in Anchorage, so no special sample shipping or packaging was required. Upon sample collection, all samples were kept chilled to 6 °C with gel ice and delivered to the laboratory by the field team following the sample collection effort. All samples were transferred to the laboratory under chain of custody (COC) procedures as outlined in the QAP. Copies of completed COCs are included with the laboratory data reports in Appendix C.

2.6 Laboratory Analyses

The water quality constituents selected for the SWM Program were established based upon the requirements of the MS4 permit. Laboratory analyses were conducted by SGS, which is certified to conduct such analyses. Analytical methods (refer to Table 2) were based on approved EPA methodology and included all necessary QA/QC procedures and analyses as outlined in the QAP.

The laboratory QA/QC activities provide information needed to assess potential laboratory contamination, analytical precision and accuracy, and representativeness. Analytical quality assurance for the SWM Program included:

- Employing analytical chemists trained in the required procedures and analytical methods
- Adherence to documented procedures, EPA methods, and laboratory standard operating procedures
- Calibration of analytical instruments
- Use of quality control samples, internal standards, surrogates, and standard reference materials (SRMs)
- Documentation of sample tracking and analysis

Internal laboratory control checks included the use of internal standards, method blanks, MS/MSDs, duplicates, laboratory control spikes and duplicates (LCS/LCSD), and SRMs as required by the sample analysis methodology. For additional detail on laboratory QA/QC procedures, refer to the QAP.

2.7 Deviation from the QAP

There were no deviations from the QAP during the 2020 monitoring year with respect to field sampling procedures, sample handling, sample chain of custody, laboratory analysis, QA/QC, and data validation.

The YSI 556 multi-probe has been discontinued and is being phased out. The YSI Pro Plus is the replacement probe that meets the sampling requirements outlined by the QAP. Both multi-probes were used during the 2020 sampling efforts.

2.8 QA/QC and Data Validation

QA/QC procedures were followed according to the QAP. The procedures included analytical checks (field replicates, trip blanks, MS/MSDs); instrument calibration; and procedures to assess data for precision, accuracy, representativeness, comparability, and completeness.

Verification analyses for laboratory parameters were conducted by SGS. The data review focused on criteria for the following QA and QC parameters and their overall effects on the data:

- Sample handling (chain of custody)
- Temperature blank
- Holding time compliance
- MS/MSD and LCS/LCSD results
- Field replicate comparison
- Data validation

SGS is certified by the EPA and the Alaska Drinking Water Program and has an approved QA/QC program. Analytical methods and testing procedures were in adherence with EPA-approved protocols and guidelines. The analyses for the fecal coliform, BOD₅, TSS, dissolved copper, total hardness, PAH, and TAH were reported with appropriate method detection limits and report detection limits.

Sample custody was maintained for the samples. The coolers transporting the samples remained at ambient temperatures or were cooled to less than 6 °C before being delivered to the laboratory within a few hours of each sampling event.

The QA/QC officer validated data reported by the laboratory. Data that was determined to be either biased low or high was flagged based on low or high recovery rates from laboratory control samples. Data that was considered suspicious was also rejected and flagged as such. For a more detailed summary of field and laboratory data validation results, refer to Appendix D. Other QA/QC procedures in 2020 included the requirement that all field team members read the QAP. Each team consisted of one ADEC-qualified sampler and one sampler in training. The field team was also required to QC data at the end of each event to determine all data were collected and sampling information was complete.

3.0 Results and Discussion

3.1 Field Measurements

In situ field measurements taken as part of the 2020 SWM Program are presented in Figures 6 through 11 and in Table 6. Reported measurements include flow, turbidity, DO, conductivity, pH, and temperature. Where relevant, *in situ* measurements are compared against Alaska Water Quality Standard (AWQS) benchmarks (refer to Table 9 for AWQS benchmarks used for comparisons). It should be noted that these AWQS benchmarks apply to the receiving waters and should be considered for comparison purposes only when reviewing stormwater.

Outfall flow rates are reported in Figure 6 and in Table 6. The flow rates were variable between sites and storm events, reflecting both the range in subbasin characteristics as well as the spatial and temporal variability of precipitation throughout the monitoring corridor. Outfall SWM08 had the highest mean flow rate (4.63 cubic feet per second (CFS)), as well as the maximum measured flow rate (9.38 CFS during Storm 4) of the 10 outfalls observed during the 2020 SWM Program. Outfall SWM04 had the lowest mean flow rate (0.10 CFS) of the outfalls sampled.

Measured turbidity levels are reported in Figure 7 and Table 6. Like flow rates, turbidity levels were variable between storms and across the monitoring corridor, with some outfalls demonstrating consistently low turbidity readings while others exhibited spikes in turbidity during one or more of the sampling events. Mean turbidity levels recorded during the 2020 SWM Program at outfalls SWM03, SWM04, SWM05, SWM06, SWM08, and SWM 11 were all below 50 Nephelometric Turbidity Units (NTU). Turbidity values at these outfalls measured as low as 6.2 NTU. In contrast, outfalls SWM07 and SWM12 had mean turbidity levels above 100 NTU. These outfalls had measurements above 100 NTU for three of the four sampled storms indicating a pattern of elevated turbidity at these locations. SWM10 had a mean turbidity of 56.0 NTU, which was largely driven by a single turbidity spike measured during Storm 4. The observed variability in turbidity measurements across outfalls and sampling events was expected as turbidity is highly dependent on specific drainage basin characteristics such as land use, land permeability, drainage slope, precipitation intensity, precipitation history, and other factors, all of which vary considerably site-to-site. Turbidity qualitatively appears to correlate to measured TSS, reported in Table 7.

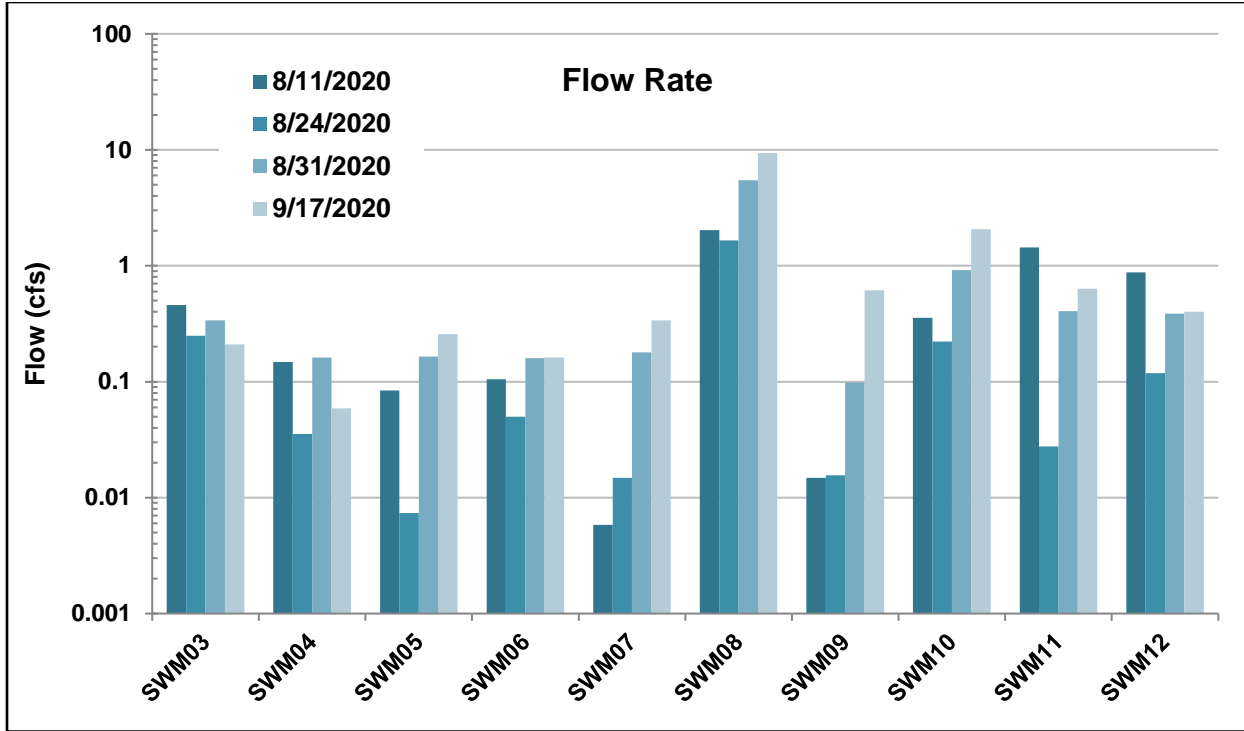


Figure 6. Flow Rates Measured at Monitoring Sites during All Four Events

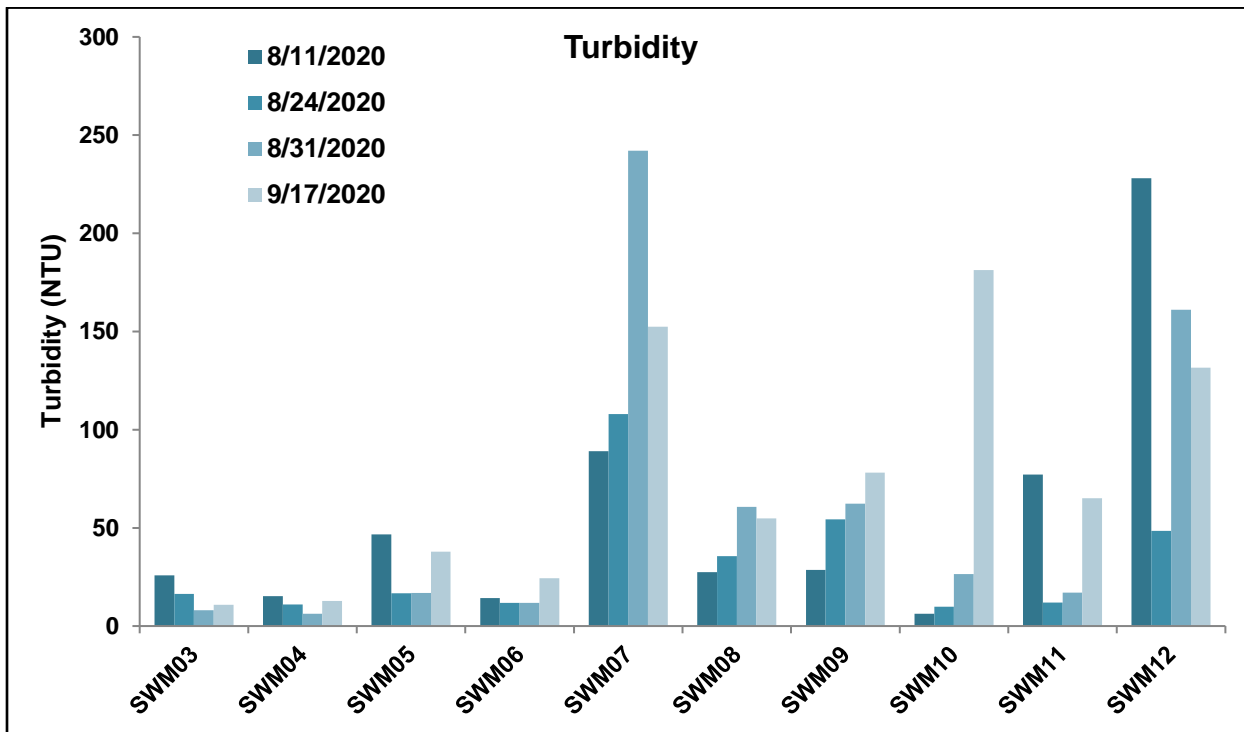


Figure 7. Turbidity Measured in Stormwater Sampled at Monitoring Sites during All Four Events

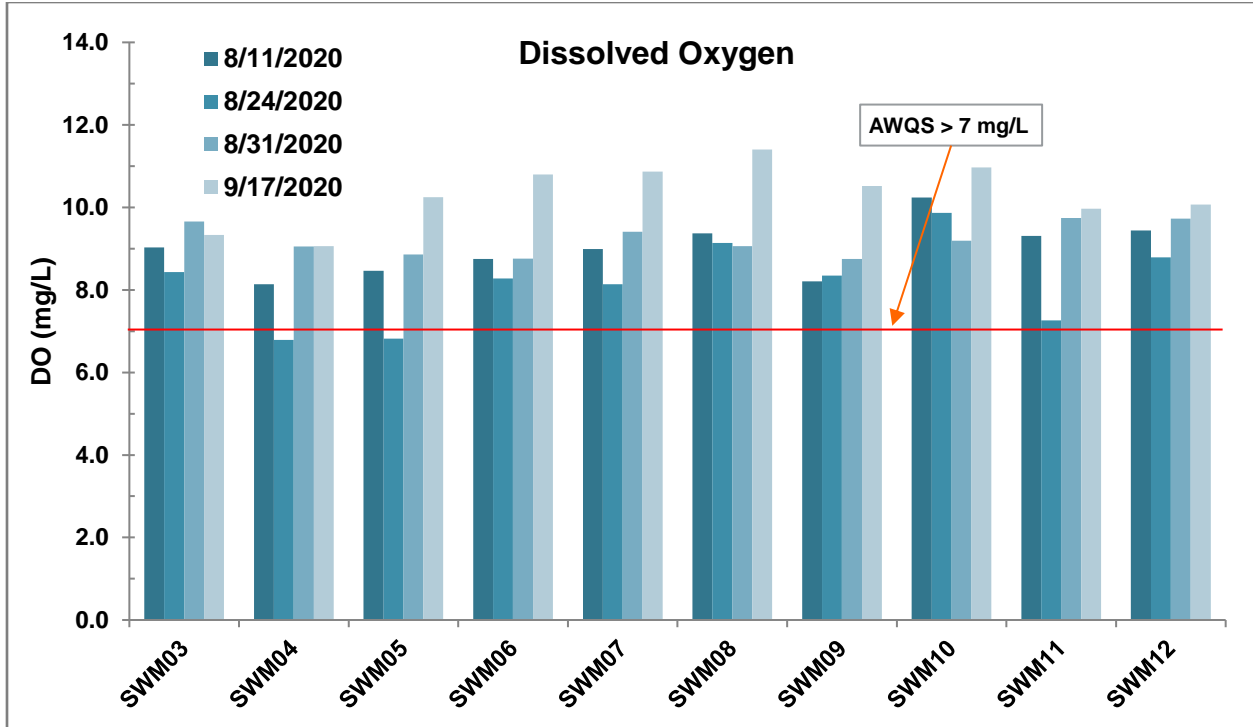


Figure 8. Dissolved Oxygen Measured in Stormwater Sampled at Monitoring Sites during All Four Events. (AWQS Criterion >7 mg/L.)

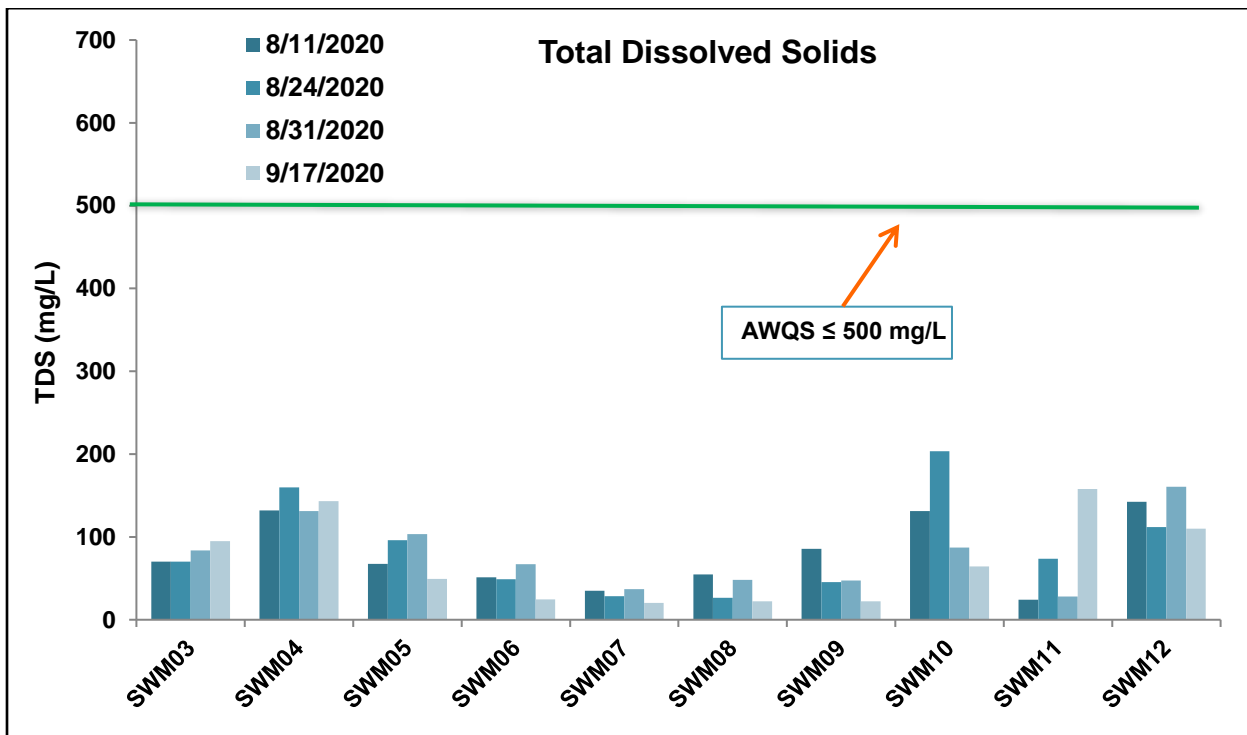
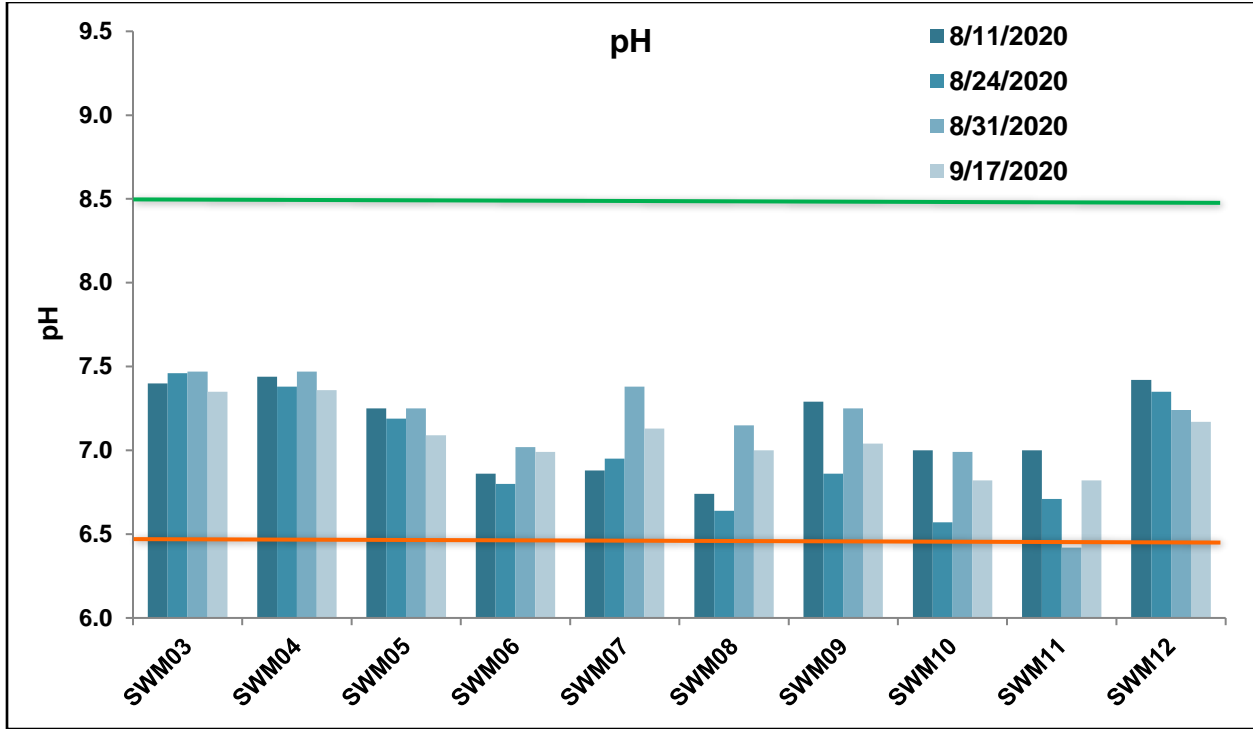
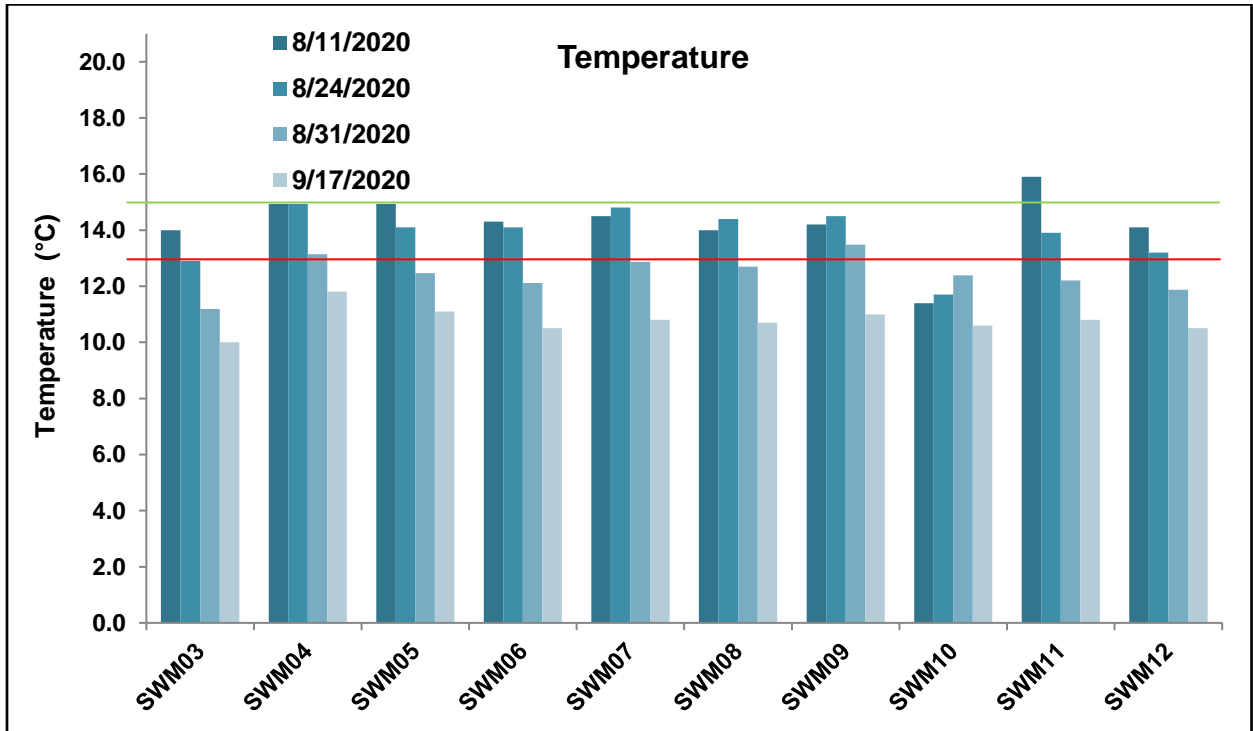


Figure 9. Total Dissolved Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events. (AWQS Criterion ≤500 mg/L.)



Green line indicates the upper AWQS pH limit of 8.5 and red line indicates the lower AWQS pH limit of 6.5.

Figure 10. pH (units) Measured in Stormwater Sampled at Monitoring Sites during All Four Events



Red line indicates the upper AWQS limit of 13°C for spawning and egg/fry incubation and green line indicates the upper AWQS limit of 15°C for migration and rearing areas.

Figure 11. Temperature (°C) Measured in Stormwater Sampled at Monitoring Sites during All Four Events



Table 6. *In situ* Parameters Measured at Monitoring Sites during All Four Sampling Events

Station	Storm 1 11-Aug-2020	Storm 2 24-Aug-2020	Storm 3 31-Aug-2020	Storm 4 17-Sept-2020	Mean
<i>Flow Rate (CFS)</i>					
SWM03	0.46	0.25	0.34	0.21	0.31
SWM04	0.15	0.04	0.16	0.06	0.10
SWM05	0.08	0.01	0.17	0.26	0.13
SWM06	0.10	0.05	0.16	0.16	0.12
SWM07	0.01	0.01	0.18	0.34	0.13
SWM08	2.02	1.66	5.45	9.38	4.63
SWM09	0.01	0.02	0.10	0.61	0.19
SWM10	0.36	0.22	0.92	2.07	0.89
SWM11	1.44	0.03	0.41	0.63	0.63
SWM12	0.87	0.12	0.39	0.40	0.44
<i>Turbidity (NTU)</i>					
SWM03	25.8	16.3	8.03	10.84	15.2
SWM04	15.2	11	6.2	12.77	11.3
SWM05	46.6	16.7	16.9	37.84	29.5
SWM06	14.3	11.8	11.8	24.32	15.6
SWM07	89.1	108	242	152.5	147.9
SWM08	27.5	35.6	60.7	54.81	44.7
SWM09	28.6	54.3	62.3	78.07	55.8
SWM10	6.33	9.89	26.5	181.3	56.0
SWM11	77.1	11.9	17.1	65.12	42.8
SWM12	228	48.5	161	131.6	142.3



Table 6. (continued)

Station	Storm 1 11-Aug-2020	Storm 2 24-Aug-2020	Storm 3 31-Aug-2020	Storm 4 17-Sept-2020	Mean
<i>Dissolved Oxygen (mg/L)</i>					
SWM03	9.03	8.43	9.66	9.33	9.1
SWM04	8.14	6.79	9.05	9.06	8.3
SWM05	8.46	6.82	8.86	10.25	8.6
SWM06	8.75	8.28	8.76	10.80	9.1
SWM07	8.99	8.14	9.41	10.87	9.4
SWM08	9.37	9.14	9.06	11.40	9.7
SWM09	8.21	8.35	8.75	10.52	9.0
SWM10	10.24	9.87	9.19	10.97	10.1
SWM11	9.31	7.26	9.74	9.97	9.1
SWM12	9.44	8.79	9.73	10.07	9.5
<i>Total Dissolved Solids (mg/L)</i>					
SWM03	70.2	70.2	83.85	94.9	79.8
SWM04	131.95	159.9	131.3	143	141.5
SWM05	67.6	96.2	103.35	49.4	79.1
SWM06	51.35	48.75	66.95	24.7	47.9
SWM07	35.1	28.6	37.05	20.15	30.2
SWM08	54.6	26.65	48.1	22.1	37.9
SWM09	85.8	45.5	47.45	22.1	50.2
SWM10	131.3	203.45	87.1	64.35	121.6
SWM11	24.05	73.45	27.95	157.95	70.9
SWM12	142.35	111.8	160.55	109.85	131.1



Table 6. (continued)

Station	Storm 1 11-Aug-2020	Storm 2 24-Aug-2020	Storm 3 31-Aug-2020	Storm 4 17-Sept-2020	Mean
<i>pH</i>					
SWM03	7.40	7.46	7.47	7.35	7.4
SWM04	7.44	7.38	7.47	7.36	7.4
SWM05	7.25	7.19	7.25	7.09	7.2
SWM06	6.86	6.80	7.02	6.99	6.9
SWM07	6.88	6.95	7.38	7.13	7.1
SWM08	6.74	6.64	7.15	7.00	6.9
SWM09	7.29	6.86	7.25	7.04	7.1
SWM10	7.00	6.57	6.99	6.82	6.8
SWM11	7.00	6.71	6.42	6.82	6.7
SWM12	7.42	7.35	7.24	7.17	7.3
<i>Temperature (°C)</i>					
SWM03	14.0	12.9	11.2	10.0	12.0
SWM04	15.6	15.1	13.1	11.8	13.9
SWM05	15.2	14.1	12.5	11.1	13.2
SWM06	14.3	14.1	12.1	10.5	12.8
SWM07	14.5	14.8	12.9	10.8	13.2
SWM08	14.0	14.4	12.7	10.7	13.0
SWM09	14.2	14.5	13.5	11.0	13.3
SWM10	11.4	11.7	12.4	10.6	11.5
SWM11	15.9	13.9	12.2	10.8	13.2
SWM12	14.1	13.2	11.9	10.5	12.4



Table 7. Concentrations of Microbiological and Conventional Parameters

Station	Storm 1 11-Aug-2020	Storm 2 24-Aug-2020	Storm 3 31-Aug-2020	Storm 4 17-Sept-2020	Mean
<i>Biochemical Oxygen Demand (mg/L)</i>					
SWM03	2.62	2U	2U	2.09	1.36
SWM04	2U	2U	2U	2U	1.00
SWM05	3.58	2U	2U	3.31	1.77
SWM06	2U	2.11	2.88	3.67	2.89
SWM07	6.01	3.62	10.60	5.55	6.59
SWM08	2.75	2.65	6.87	4.47	4.66
SWM09	4.40	3.30	4.70	3.81	3.94
SWM10	2U	2U	2.04	5.18	2.74
SWM11	4.10	2.87	2.80	4.17	3.28
SWM12	6.49	3.18	4.23	5.77	4.39
<i>Total Suspended Solids (mg/L)</i>					
SWM03	17.0	11.8	4.0	8.0	10.2
SWM04	8.8	16.6	3.8	7.8	9.2
SWM05	17.8	6.0	8.4	26.6	14.7
SWM06	7.0	8.0	7.6	29.0	12.9
SWM07	35.0	57.5	123.0	165.0	95.1
SWM08	17.2	34.0	35.2	59.0	36.4
SWM09	10.2	32.9	32.6	91.7	41.8
SWM10	2.8	4.2	22.0	268.0	74.2
SWM11	72.0	6.0	12.8	39.3	32.5
SWM12	108.0	20.0	76.0	89.0	73.3

Footnotes: U = not detected at method detection limit (shown). Mean calculations utilize 1/2 the method detection limit.



Table 7. (continued)

Station	Storm 1 11-Aug-2020	Storm 2 24-Aug-2020	Storm 3 31-Aug-2020	Storm 4 17-Sept-2020	Geometric Mean
Fecal Coliform (FC/100 mL)					
SWM03	2100	664	1060	220	755
SWM04	6900	9730	2800	673	3354
SWM05	1390	2100	5200	1140	2040
SWM06	640	1800	818	470	816
SWM07	2000	1100	5350	1050	1875
SWM08	1300	10100	3200	2100	3065
SWM09	2400	2800	3100	791	2015
SWM10	30	148	627	450	188
SWM11	4400	5200	430	636	1582
SWM12	16500	4100	3800	2300	4931

Footnotes: U = not detected at the associated method detection limit shown. Mean calculations used geometric mean for fecal coliform and utilized 1/2 the method detection limit where analyte was not detected.

Dissolved oxygen (DO) levels are reported in Figure 8 and in Table 6. Measured DO levels were typical for Alaska streams, with most measurements above the AWQS threshold of 7 milligrams/liter (mg/L) (Table 10). During Storm 2, two outfalls measured just below this threshold with measurements of 6.79 mg/L at SWM04 and 6.82 mg/L at SWM05. Mean DO concentrations across the four sampled storm events ranged from a low of 8.3 mg/L at SWM04 to a high of 10.1 mg/L at SWM10. The highest measured DO concentrations occurred during the Storm 4, which was the largest storm sampled during the 2020 SWM Program. The elevated DO during Storm 4 reflects colder water temperatures and higher turbulent flows resulting from the magnitude of the storm.

Although not required by the monitoring plan, specific conductivity was recorded at each site since it was available on the portable multi-parameter meter and is considered useful for interpretation of stormwater data. Specific conductivity was converted to total dissolved solids (TDS) concentrations so comparisons could be made with the AWQS criterion. TDS concentrations are reported in Figure 9 and in Table 6. TDS concentrations were generally low with mean concentrations below 150 mg/L at each of the ten outfalls across the four sampling events. All individual measurements were well below the AWQS criterion of 500 mg/L. These concentrations are in line with historical data. In peak years, mean TDS concentrations occasionally exceeded

200 mg/L, significantly higher than concentrations observed during the 2020 monitoring year. The maximum TDS concentrations observed during the 2020 SWM Program varied without a clear pattern in the measured data with regards to sample date and outfall location.

Measurements for pH are reported in Figure 10 and Table 6, and generally fall within AWQS criteria. Rainfall is often slightly acidic, and the National Atmospheric Deposition Program (NADP) indicates that rainfall in Alaska typically falls with a pH of 5.1 to 5.2 (NADP 2019). Measured pH levels during the 2020 SWM Program varied between outfall locations and storm events, again without a clear pattern in the data. The minimum recorded pH value occurred at SWM11 during Storm 3, and was 6.42, slightly below the AWQS guideline of 6.5 (Table 10) for the Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife. The maximum observed pH value of 7.47 was recorded during Storm 3 at both SWM03 and SWM04 and fell within AWQS guidelines (maximum of 8.5).

Temperature measurements are reported in Figure 11 and in Table 6. At each outfall site, temperature generally decreased with each consecutive monitoring event reflecting the progressively cooler fall weather. SWM10 had by far the lowest mean temperature (11.5°C) in the measured samples and was also the only outfall to see a temperature rise for the first three monitoring events before falling for the last event. SWM04 had the highest mean temperature (13.9°C) of the outfalls monitored in the 2020 Program. Most temperature measurements were found to be below the AWQS criterion of 15°C for fish migration routes and rearing areas, with only three individual samples measuring above 15°C.

In addition to the standard field measurements, the field team also recorded observations of odor and visible water color, clarity, floatables, deposits or stains, sheens, and debris. A faint hydrocarbon odor was noticed at SWM08 during the second sampling event as well as at SWM09 during the third sampling event. Observations of water color and clarity were consistent and matched those outfalls where high turbidity and TSS were observed. No floatables were noted in the field logs. Some stains (rust) were observed at SWM10, which may be an indication of corrosion of the stormwater piping or simply the result of high iron content that is often seen in Anchorage streams. Other observations included some garbage-type debris, leaves, sticks, and algae. Other than hydrocarbons and turbidity, no attempt has been made to correlate the visual observations with the conventional or pollutant measurements.

3.2 Conventional Parameters (BOD₅ and TSS)

Biochemical oxygen demand (BOD₅) concentrations from the 2020 SWM Program are reported in Figure 12 and in Table 7. BOD₅ concentrations were found to be low at all locations for all four storm events. Concentrations ranged from a low of not detected (ND, or <2 mg/L) at many sites to a high of 10.60 mg/L measured at SWM07 during the third storm event. For comparison, the maximum recorded BOD₅ concentration in 2018 was 21.8 mg/L, nearly two times greater than the 2020 maximum recorded value. BOD₅ was at or below the detection limit of 2 mg/L in eleven samples, tested at SWM03, SWM04, SWM05, SWM06 and SWM10. For these samples, one half of the method detection limit was used in the calculation of means.

Measurements for concentrations of total suspended solids (TSS) are presented in Figure 13 and in Table 7. As noted earlier, TSS levels are correlated with turbidity measurements. As with turbidity, TSS concentrations were variable between storms and across the monitoring corridor, with some outfalls demonstrating consistently low TSS readings while others exhibited spikes in TSS concentrations. Outfalls SWM03, SWM04, SWM05, SWM06, SWM08, SWM09 and SWM11 all have mean TSS concentrations below 50 mg/L across the four storm events sampled. In contrast, outfalls SWM07, SWM10, and SWM12 had the highest mean TSS concentrations with mean concentrations of 70 mg/L or greater. At outfall SWM10, the elevated mean TSS reading is driven by a single spike in the data, with a TSS measurement for Storm 4 of 268.0 mg/L, the highest single TSS measurement recorded during the 2020 SWM Program. This spike coincides with a measured spike in turbidity at SWM10 for Storm 4. Excluding this spike, the mean TSS for the other three storms sampled at SWM10 was 9.7 mg/L.

3.3 Fecal Coliform

Fecal Coliform measurements are presented in *Green line indicates AWQS benchmark of less than 200 CFU/100 mL.*

Figure 14 and in Table 7. In general, fecal coliform levels in 2020 fell within average historical ranges with concentrations decreased from levels observed in 2016, 2017, and 2018, but slightly increased from levels observed in 2019. Geometric mean concentrations for fecal coliform measured as part of the 2020 SWM Program ranged from 188 colony forming units per 100 mL (CFU/100mL) to 4,931 CFU/100mL. The station with the lowest geometric mean fecal coliform concentration was SWM10 with a concentration of 188 CFU/100mL; stations SWM03 and SWM06 also exhibited geometric mean fecal coliform levels below 1,000 CFU/100mL. The highest geometric mean fecal coliform concentrations were found at outfalls SWM04, SWM08, and SWM12, with measurements of 3,354, 3,065, and 4,931 CFU/100mL respectively.

The highest measured fecal coliform concentration measured as part of 2020 SWM Program was 16,500 CFU/100mL at outfall SWM12 during Storm 1. Overall, peak concentrations found in 2020 were decreased from peak measurements made in the 2016-2018 monitoring period but slightly increased from 2019 measurements which were made unusually late in the fall. A previous analysis of fecal coliform in Anchorage streams indicated that the highest loads would most likely occur in August/September in association with peak runoff and rainfall (MOA 2003). Multi-year data collected as part of this SWM Program so far has not supported that conclusion and suggests that the highest fecal coliform levels should be expected in July for these ten specific outfalls. Yearly and seasonal trends are discussed in further detail in Section 3.7.

Despite the general decrease in measured fecal coliform concentrations during the 2020 SWM Program relative to the 2016-2018 period, fecal coliform measurements were still found to exceed the AWQS benchmark of 200 CFU/100 mL. While the AWQS criterion does not technically apply to stormwater, the limit of 200 CFU/100 mL is adopted as the most relevant benchmark based on comparable water use categories referenced in the AWQS definitions (refer to Table 10). Studies conducted by the EPA in the early 1980s indicate that the median concentration of fecal coliform in cold climate urban runoff is typically in the 1,000 CFU/100 mL range, which is comparable to levels seen during the 2020 SWM Program (EPA 1983).

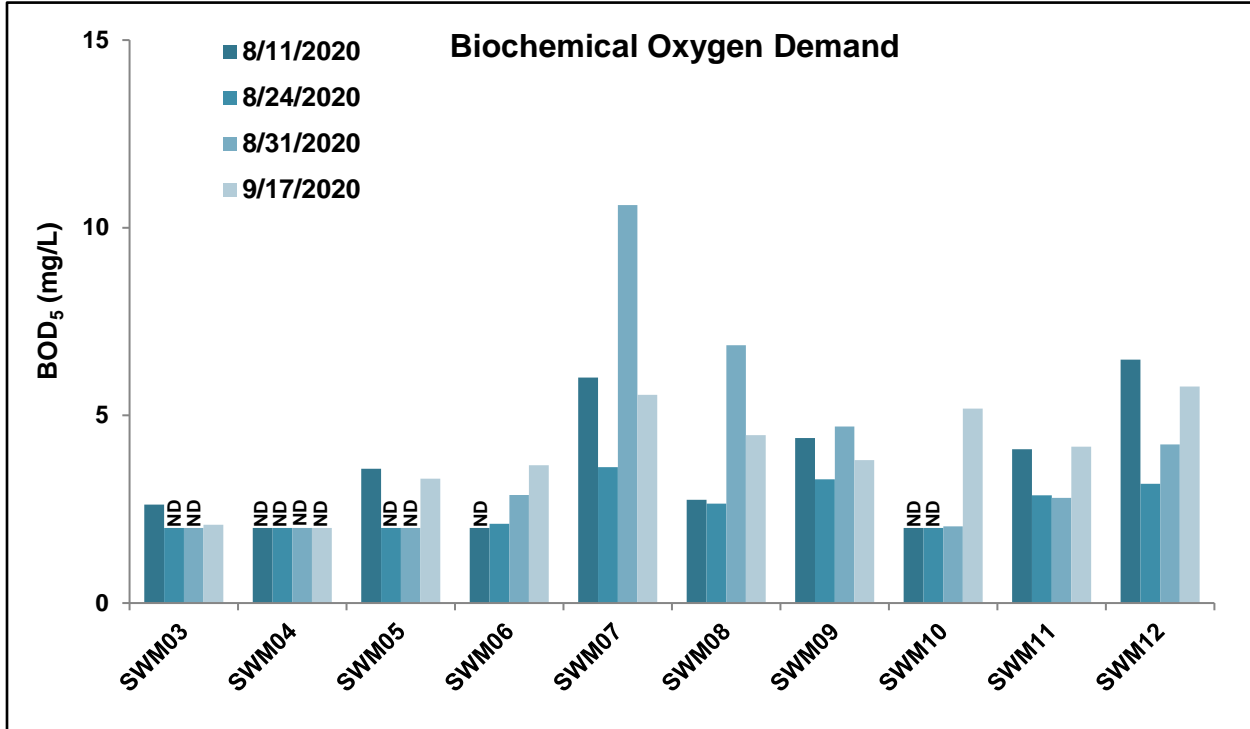


Figure 12. BOD₅ (mg/L) Measured in Stormwater Sampled at Monitoring Sites during All Four Events (Note: ND ≤ 2 mg/L)

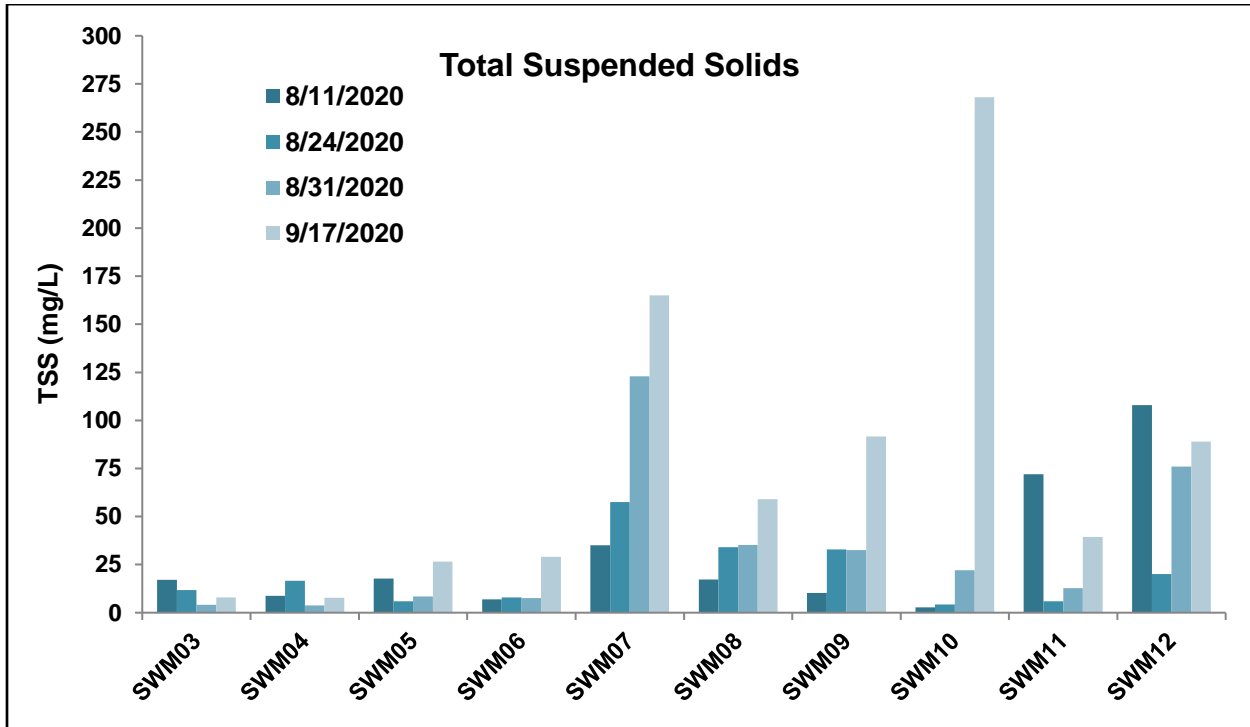
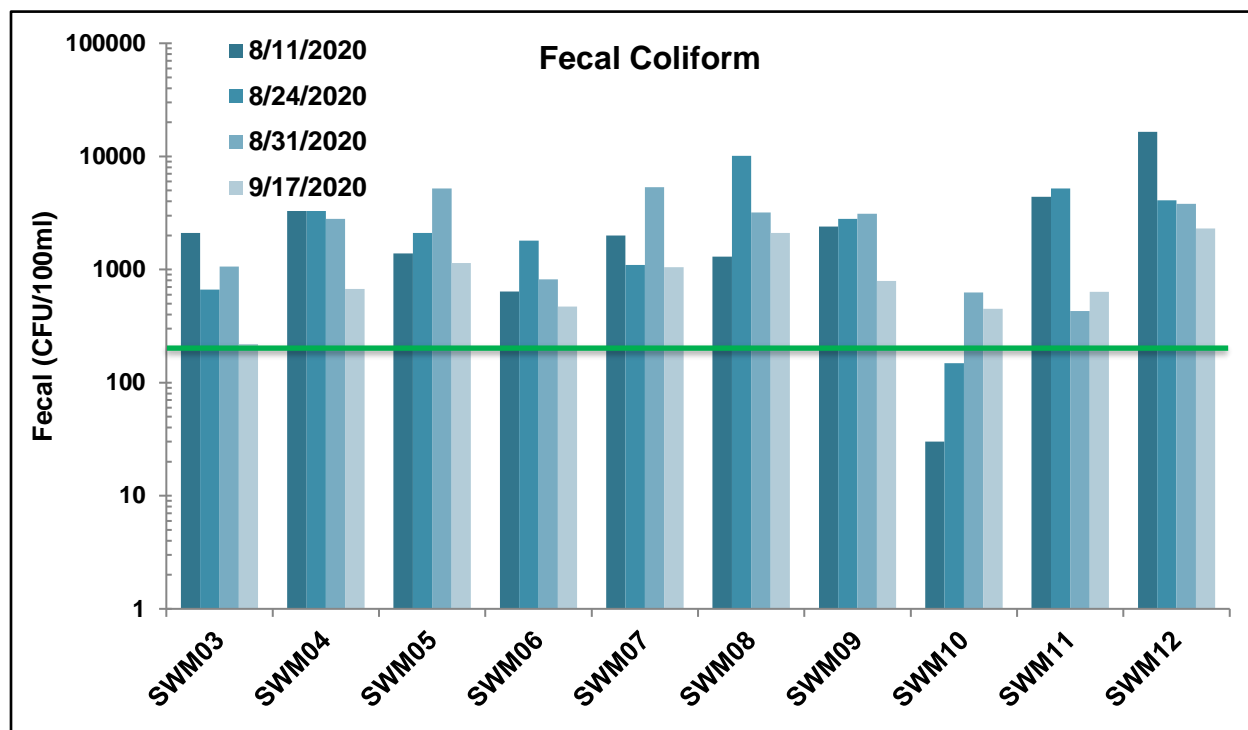


Figure 13. Total Suspended Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events



Green line indicates AWQS benchmark of less than 200 CFU/100 mL.

Figure 14. Fecal Coliform (FC/100 mL) Measured in Stormwater Sampled at Monitoring Sites during All Four Events

Despite the fact that the adopted fecal coliform benchmark of 200 CFU/100mL applied to streams was exceeded during most storms at most outfalls, overall mean concentrations were not alarming when compared to typical concentrations seen in warmer urban areas which can range from the 10,000s to 100,000s CFU/100mL (EPA 1983). However, the high year-to-year variability in fecal coliform measurements suggests the need to continue monitoring this parameter over a relatively extended time period to better assess the performance of control measures.

3.4 Metals and Hardness

Monitoring of dissolved copper and total water hardness were added to the Program in 2016 for all locations and storms. The monitoring conducted in years prior to 2016 did not include these two parameters.

Hardness measurements are presented in Table 8 and Figure 15. Hardness is an important parameter for freshwater since it interacts with dissolved metals such as copper to affect metal toxicity thresholds. Mean hardness concentrations ranged from a low of 19.3 mg/L at SWM07 to a high of 83.4 mg/L at SWM10. For Storm 4, lab analysis for hardness required a 10x dilution which increased the MDL to 50 mg/L. Based on Storm 1 through 3, it is likely that the hardness concentrations ranged from 19 to 83. Samples that returned non-detect hardness readings from Storm 4 were not included in reported mean hardness measurements. Typically, within the same waterbody, hardness is inversely correlated to turbidity and TSS, and this was observed in the 2020 monitoring data.

Dissolved copper measurements are presented in Table 8 and Figure 16. Dissolved copper measurements in 2020 were decreased relative to 2019 measurements. Dissolved copper concentrations were quite variable and ranged from 0.788 micrograms/liter ($\mu\text{g/L}$) at SWM10 during Storm 2 to a high of 8.39 $\mu\text{g/L}$ at SWM07 during Storm 3. SWM10 had the lowest mean copper concentration at 0.96 $\mu\text{g/L}$ while SWM07 had the highest mean copper concentration of 5.57 $\mu\text{g/L}$. Importantly, all outfalls had mean concentrations below the AWQS minimum of 6.99 $\mu\text{g/L}$. The criteria for copper are determined in conjunction with water hardness measurements. For the State of Alaska, the acute water quality criteria for copper ranges from a concentration of 6.99 $\mu\text{g/L}$ at a hardness of 50 mg/L to a concentration of 13.44 $\mu\text{g/L}$ at a hardness value of 100 mg/L. The AWQS criteria applies to the receiving waters and is used for comparison purposes only when evaluating stormwater.



Table 8. Concentrations of Hardness and Dissolved Copper.

Station	Storm 1 11-Aug-2020	Storm 2 24-Aug-2020	Storm 3 31-Aug-2020	Storm 4 17-Sept-2020	Mean
<i>Hardness (mg/L)</i>					
SWM03	43.7	47.1	47.5	61.7	50.0
SWM04	68.1	86	76.6	74.9	76.4
SWM05	36.4	53	5U	50U*	30.6
SWM06	30	30.4	39.6	50U*	33.3
SWM07	19.3	17.6	21.1	50U*	19.3
SWM08	25.2	13.1	24.7	50U*	21.0
SWM09	45.6	27.2	26.6	50U*	33.1
SWM10	107	102	41.3	50U*	83.4
SWM11	17	45.4	15.9	50U*	26.1
SWM12	80.7	61.9	81.3	63.4	71.8
<i>Dissolved Copper (µg/L)</i>					
SWM03	3.68	1.77	1.81	2.37	2.4
SWM04	3.47	3.35	2.48	2.41	2.9
SWM05	5.98	3.96	3.81	2.70	4.1
SWM06	2.41	2.29	2.72	1.25	2.2
SWM07	5.43	4.40	8.39	4.06	5.6
SWM08	2.63	2.01	2.94	2.45	2.5
SWM09	2.81	2.55	2.31	1.18	2.2
SWM10	0.96	0.79	0.88	1.21	1.0
SWM11	3.03	3.58	1.82	2.58	2.8
SWM12	6.06	4.79	3.88	4.11	4.7

Footnotes: U = not detected at the associated reporting limit that is shown. * = not detected, lab 10x dilution increased the MDL to 50 mg/L.

Mean calculations utilize 1/2 the detection limit for samples marked U, do not include samples marked *.

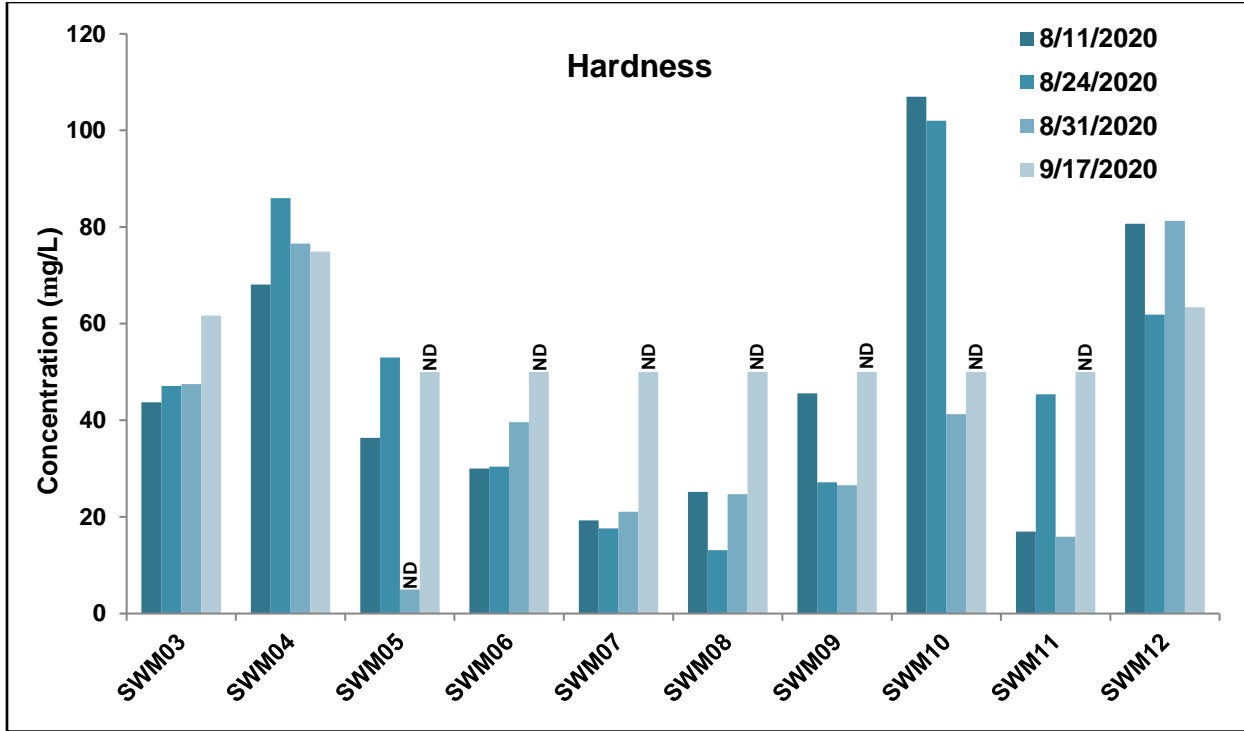
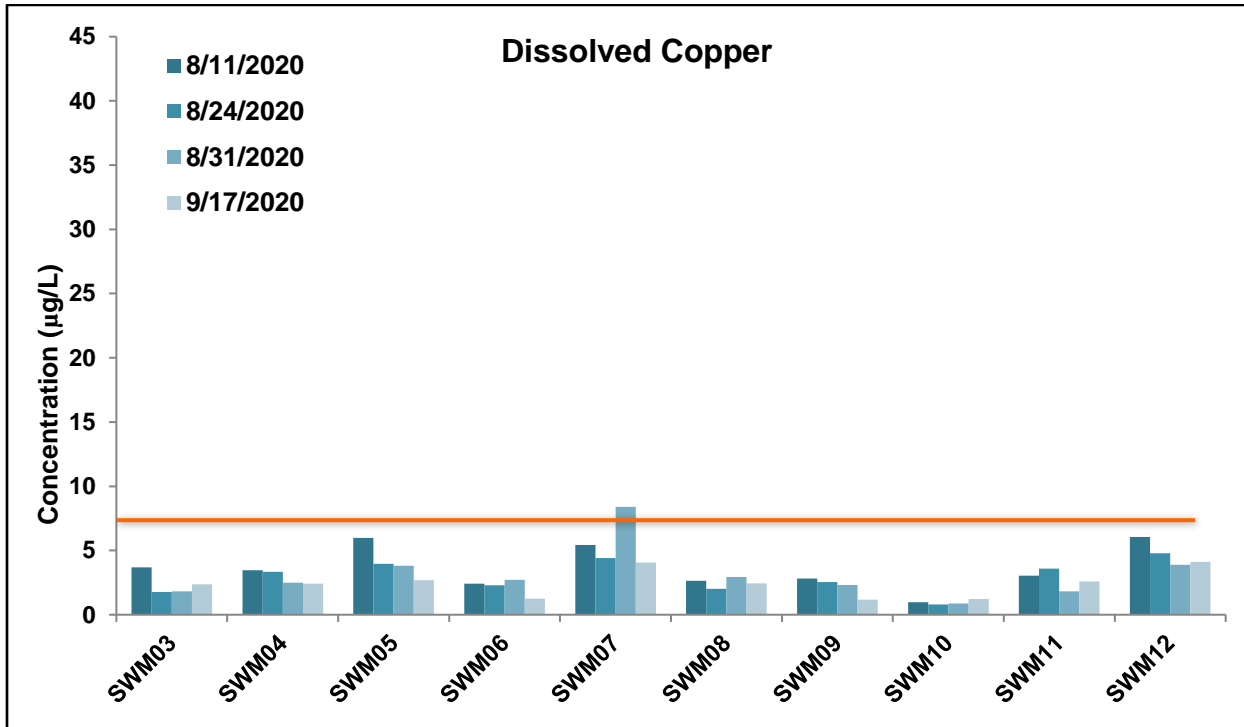


Figure 15. Water Hardness (mg/L) Measured in Stormwater Samples



Acute AWQS based on hardness value of 50 mg/L in the receiving water.

Figure 16. Dissolved Copper (µg/L) Measured in Stormwater Samples



3.5 Hydrocarbons

Total aromatic hydrocarbons (TAH) and total polycyclic aromatic hydrocarbons (TPAH) were measured as part of the 2020 SWM Program at four selected outfalls: SWM05, SWM07, SWM09, and SWM12. In the 2020 SWM Program, TPAH constituents were detected at three of the four monitoring sites: SWM07, SWM09, and SWM12, while TAH constituents were detected at only SWM09. For this study TAH is reported as the summation of detected concentrations of benzene, ethylbenzene, toluene, and xylenes (BTEX). Dichlorobenzene and Chlorobenzene were not analyzed in 2020 due to reclassification of these parameters by ADEC. Hydrocarbon measurements are presented in Figure 17 and in Table 9. All samples collected fell within the AWQS criteria (Table 10) of 10 µg/L for TAH and 15 µg/L for total aqueous hydrocarbons (TAqH), representing the summation of TAH and TPAH.

TAH (BTEX) was detected in four samples in the 2020 monitoring year, decreased from the seven samples where BTEX were detected in 2019. All four samples with BTEX detection in 2020 were collected at SWM09. Hydrocarbon odors were also noted at SWM09 during Storm 3. BTEX concentrations ranged from 0.32 µg/L to 0.58 µg/L at SWM09. Toluene was the only detected BTEX constituent in each of these samples. The 2020 BTEX measurements are significantly decreased from peak BTEX concentrations detected in the 2019 monitoring year. All other samples at the three other outfalls in 2020 returned non-detect readings for BTEX constituents.

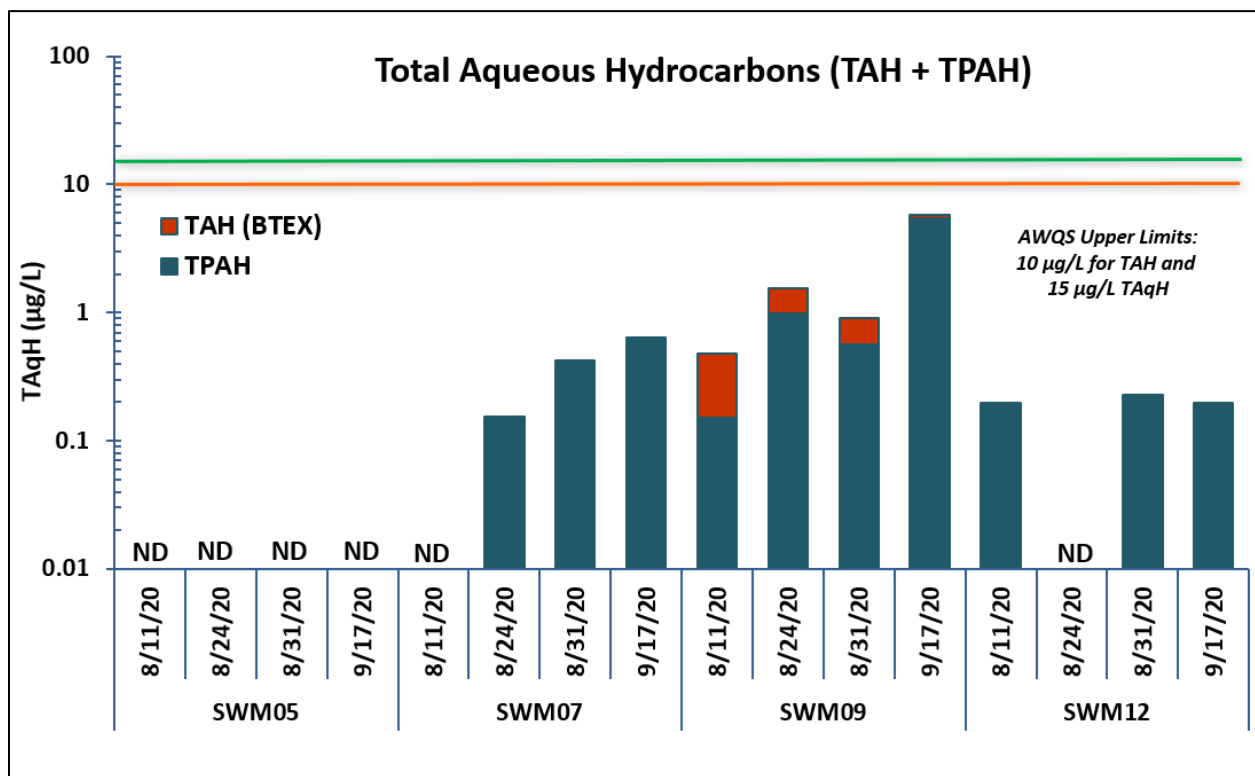


Figure 17. Total Aqueous Hydrocarbons (TAqH = TAH + TPAH) Measured in Stormwater Sampled at Monitoring Sites during All Four Events. (AWQS ≤ 10 µg/L for TAH and ≤ 15 µg/L for TAqH.)

TPAH concentrations varied between storm events and between the four outfalls tested. SWM05 had no detectible TPAH concentrations during any of the storm events sampled. SWM09 had the highest mean TPAH across the four storm events, with a maximum value of 5.419 µg/L during Storm 4. In addition to having the greatest mean TPAH concentration, SWM09 also had the greatest diversity of detected analytes. During Storm 4, 11 of the 16 tested PAH analytes were detected at SWM09, and on average, SWM09 had over twice the number of unique analytes detected compared to the other sites. Across all outfalls, the most commonly detected TPAH compounds were combustion-related compounds including pyrene, fluoranthene and phenanthrene.

The hydrocarbon detection at SWM09 in 2020 was slightly increased from 2019. The increased prevalence of hydrocarbon detection at SWM09 potentially reflects an increase in midweek traffic in the parking lot adjacent to the outfall during the summer of 2020 as a result of MOA's COVID-19 mass shelter at the Sullivan Arena. Monitoring activities typically occur midweek, and while there were fewer large weekend events held at the Sullivan Arena, there was an increase in midweek traffic and activity in the subbasin.

Contaminants, particularly TPAH, can present in higher levels early in the storm runoff period as result of the first flush of accumulated contaminants from roadways and other urban surfaces. This was not observed in the 2020 SWM Program, likely as result of consistent precipitation events throughout the summer of 2020 prior to the monitoring period which provided continual flushing, as depicted the precipitation charts presented in Figure 4 and Figure 5.

Two of the outfalls tested for hydrocarbons - SWM05 and SWM09 - have OGS units, while SWM07 and SWM12 do not. There does not appear to be a correlation between the presence of an OGS unit and measured hydrocarbon concentrations.



Table 9. Hydrocarbon Concentrations Measured in Stormwater at Four Sites during All Four Storm Events.

	SWM05 - OGS (Yes)				SWM07 - OGS (No)				SWM09 - OGS (Yes)				SWM12 - OGS (No)			
	8/11/2020	8/24/2020	8/31/2020	9/17/2020	8/11/2020	8/24/2020	8/31/2020	9/17/2020	8/11/2020	8/24/2020	8/31/2020	9/17/2020	8/11/2020	8/24/2020	8/31/2020	9/17/2020
Polycyclic Aromatic Hydrocarbons (µg/L)																
Acenaphthene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.024U	0.0261U	0.024U	0.0245U	0.0245U	0.0261U	0.0232U
Acenaphthylene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.024U	0.0261U	0.024U	0.0245U	0.0245U	0.0261U	0.0232U
Anthracene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.024U	0.0261U	0.024U	0.0245U	0.0245U	0.0261U	0.0232U
Benzo(a)anthracene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.0479J	0.0261U	0.3370	0.0245U	0.0245U	0.0261U	0.0232U
Benzo(a)pyrene	0.0096U	0.0102U	0.0096U	0.0098U	0.0099U	0.00925U	0.0096U	0.00945U	0.0107U	0.05370	0.0104U	0.4380	0.0098U	0.0098U	0.0104U	0.00925U
Benzo(b)fluoranthene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.1610	0.0261U	0.8440	0.0245U	0.0245U	0.0261U	0.0232U
Benzo(g,h,i)perylene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.1140	0.0267U	0.08730	0.06850	0.4720	0.0245U	0.0245U	0.0261U	0.0232U
Benzo(k)fluoranthene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.024U	0.0261U	0.246RP	0.0245U	0.0245U	0.0261U	0.0232U
Chrysene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0630	0.0267U	0.1550	0.1320	0.6350	0.0245U	0.0245U	0.0261U	0.0232U
Dibenzo(a,h)anthracene	0.0096U	0.0102U	0.0096U	0.0098U	0.0099U	0.00925U	0.0096U	0.00945U	0.0107U	0.0096U	0.0104U	0.0960	0.0098U	0.0098U	0.0104U	0.00925U
Fluoranthene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0490	0.1340	0.150	0.08860	0.1990	0.1710	0.910	0.08410	0.0245U	0.07420	0.05890
Fluorene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.024U	0.0261U	0.024U	0.0245U	0.0245U	0.0261U	0.0232U
Indeno(1,2,3-cd)pyrene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0232U	0.024U	0.0236U	0.0267U	0.06950	0.0261U	0.4110	0.0245U	0.0245U	0.0261U	0.0232U
Naphthalene	0.0481U	0.051U	0.0481U	0.049U	0.0496U	0.0463U	0.0481U	0.0471U	0.0535U	0.0481U	0.052U	0.0481U	0.049U	0.049U	0.052U	0.0463U
Phenanthrene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.0411J	0.08080	0.1190	0.0267U	0.06280	0.05850	0.2930	0.0245U	0.0245U	0.06480	0.05760
Pyrene	0.024U	0.0255U	0.024U	0.0245U	0.0248U	0.06470	0.2090	0.1910	0.06330	0.1420	0.1320	0.7370	0.1140	0.0245U	0.08710	0.07890
Volatile Aromatic Hydrocarbons (µg/L)																
Benzene	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
Ethylbenzene	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
o-Xylene	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
P&M-Xylene	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
Toluene	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.329J	0.58J	0.348J	0.32J	0.5U	0.5U	0.5U
Hydrocarbon Summary Parameters (µg/L)																
TPAH	ND	ND	ND	ND	ND	0.1548	0.4238	0.637	0.1519	0.9782	0.562	5.419	0.1981	ND	0.2261	0.1954
TAH as BETX	ND	ND	ND	ND	ND	ND	ND	ND	0.329	0.58	0.348	0.32	ND	ND	ND	ND
TAqH (TPAH + TAH)	ND	ND	ND	ND	ND	0.1548	0.4238	0.637	0.4809	1.5582	0.91	5.739	0.1981	ND	0.2261	0.1954

Footnotes: U = not detected at the reporting limit. ND = no concentration detected in any analyte tested. J = Estimated value below the detection limit. RP = Manual data integration by lab, reassigned peak name.

All detected concentrations are shown in bold. Hydrocarbon summary parameters only include detected concentrations.



Table 10. Pertinent Numeric Alaska Water Quality Standard (AWQS) Criteria

Designated Use	Description of Standard
Fecal Coliform Bacteria	
(A) Water Supply (i) drinking, culinary and food processing	In a 30-day period, the geometric mean may not exceed 20 FC/100 ml, and not more than 10% of the samples may exceed 40 FC/100 ml.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	The geometric mean of samples taken in a 30-day period may not exceed 200 FC/100 ml, and not more than 10% of the samples may exceed 400 FC/100 ml. For products not normally cooked and for dairy sanitation of unpasteurized products, the criteria for drinking water supply, (1)(A)(i), apply.
(A) Water Supply (iii) aquaculture	For products normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 200 FC/100 ml, and not more than 10% of the samples may exceed 400 FC/100 ml. For products not normally cooked, the criteria for drinking water supply, (1)(A)(i), apply.
(A) Water Supply (iii) Industrial	Where worker contact is present, the geometric mean of samples taken in a 30-day period may not exceed 200 FC/100 ml, and not more than 10% of the samples may exceed 400 FC/100 ml.
(B) Water Recreation (iv) contact recreation	In a 30-day period, the geometric mean of samples may not exceed 100 FC/100 ml, and not more than one sample or more than 10% of the samples if there are more than 10 samples, may exceed 200 FC/100 ml.
(B) Water Recreation (ii) secondary contact	In a 30-day period, the geometric mean of samples may not exceed 200 FC/100 ml, and not more than 10% of the total samples may exceed 400 FC/100 ml.
(C) Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	Not applicable.
Dissolved Oxygen (most restrictive shown)	
(A) Water Supply (iii) aquaculture (C) Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	DO must be greater than 7mg/L in surface waters. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection.
pH	
(A) Water Supply (i) drinking, culinary and food processing	May not be less than 6.0 or greater than 8.5.
(A) Water Supply (ii) agriculture, including irrigation and stock watering, & (iv) Industrial	May not be less than 5.0 or greater than 9.0.



Table 10 (continued). Pertinent Numeric Alaska Water Quality Standard (AWQS) Criteria

Designated Use	Description of Standard
pH (continued)	
(A) Water Supply (iii) aquaculture	May not be less than 6.5 or greater than 8.5. May not vary more than 0.5 pH unit from natural conditions.
(B) Water Recreation (iv) contact recreation	May not be less than 6.5 or greater than 8.5. If natural condition pH is outside this range, substances may not be added that cause an increase in the buffering capacity of the water.
(B) Water Recreation (ii) secondary contact	Same as (6)(A)(iv)
(C) Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	May not be less than 6.5 or greater than 8.5. May not vary more than 0.5 pH unit from natural conditions.
Petroleum Hydrocarbons	
(A) Water Supply (iii) aquaculture & (C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife.	TAqH in the water column may not exceed 15 µg/L. TAH in the water column may not exceed 10 µg/L. Surface waters and adjoining shorelines must be virtually free from floating oil, film, or discoloration.
Dissolved Inorganic Substances (most restrictive shown)	
(A) Water Supply (i) drinking, culinary, and food processing	Total dissolved solids (TDS) from all sources may not exceed 500 mg/L.
Temperature (most restrictive shown)	
(A) Water Supply (iii) aquaculture & (C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife.	The following maximum temperatures may not be exceeded, where applicable: Migration routes and rearing areas: 15°C Spawning areas, egg & fry incubation: 13°C



Table 10 (continued). Pertinent Numeric Alaska Water Quality Standard (AWQS) Criteria

Turbidity						
(A) Water Supply (i) drinking, culinary, and food processing		May not exceed 5 nephelometric turbidity units (NTU) above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU.				
(A) Water Supply (ii) agriculture, including irrigation and stock watering		May not cause detrimental effects on indicated use.				
(A) Water Supply (iii) aquaculture		May not exceed 25 NTU above natural conditions. For all lake waters, may not exceed 5 NTU above natural conditions.				
(A) Water Supply (iv) industrial		May not cause detrimental effects on established water supply treatment levels.				
(B) Water Recreation (i) contact recreation		May not exceed 5 NTU above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 15 NTU. May not exceed 5 NTU above natural turbidity for all lake waters.				
(B) Water Recreation (ii) secondary recreation		May not exceed 10 NTU above natural conditions when natural turbidity is 50 NTU or less, and may not have more than 20% increase in turbidity when the natural turbidity is greater than 50 NTU, not to exceed a maximum increase of 15 NTU. For all lake waters, turbidity may not exceed 5 NTU above natural turbidity.				
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife		Same as (12)(A)(iii).				
Dissolved Copper (µg/L)						
Metal	m _A	b _A	m _C	b _C	Freshwater Conversion Factors (CF)	
					Acute (CMC)	Chronic (CCC)
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960
Hardness-dependent criteria may be calculated from the following for freshwater metals:						
Acute (dissolved) = exp {m _A [ln(hardness)] + b _A } (CF)						
Chronic (dissolved) = exp {m _C [ln(hardness)] + b _C } (CF)						

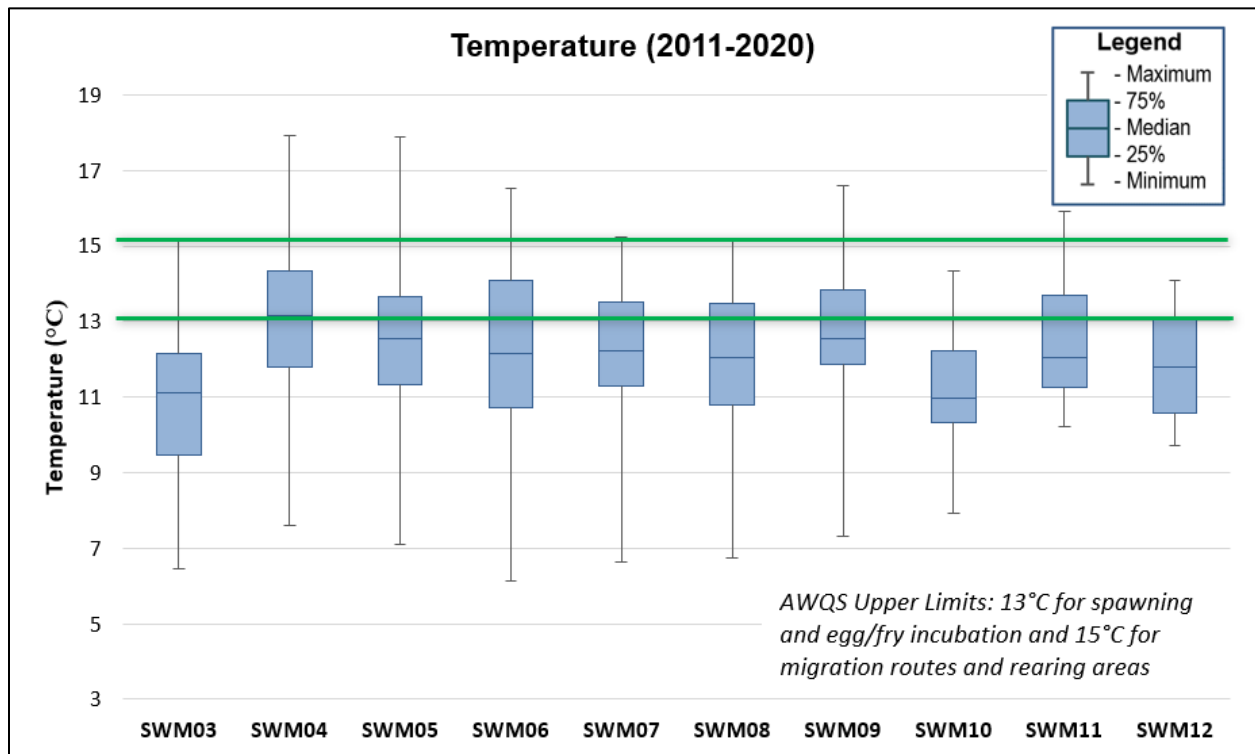


3.6 Multi-Year Site Trends

Review of the SWM Program data record reveals persistent differences between outfalls with regards to measured parameters. This section discusses site trends for each parameter, and where applicable, statistical analysis is used to further study these trends.

The stormwater outfall sampling conducted in 2020 represented the tenth year of sampling under the SWM Program. These ten years of sampling provide a data record for preliminary investigation of differences between the monitoring sites included in the Program. General site differences were investigated through statistical analysis to compare outfalls where applicable for parameters that follow normal or log-normal distributions. Box plots have been prepared for visualization of the data record for each parameter tested (Figures 18-26). The box plots depict the minimum, maximum, median, 25th-percentile, and 75th-percentile of the data collected over the ten-year monitoring period. It should be noted that outfalls SWM11 and SWM12 were added to the SWM Program in 2017 and therefore have shorter data records than the other outfalls. It is important to note that due to the relatively short data record, caution should be warranted when comparing outfalls. Given evolving land uses and myriad other influences, it can be difficult to compare multivariate environmental systems based on short data records.

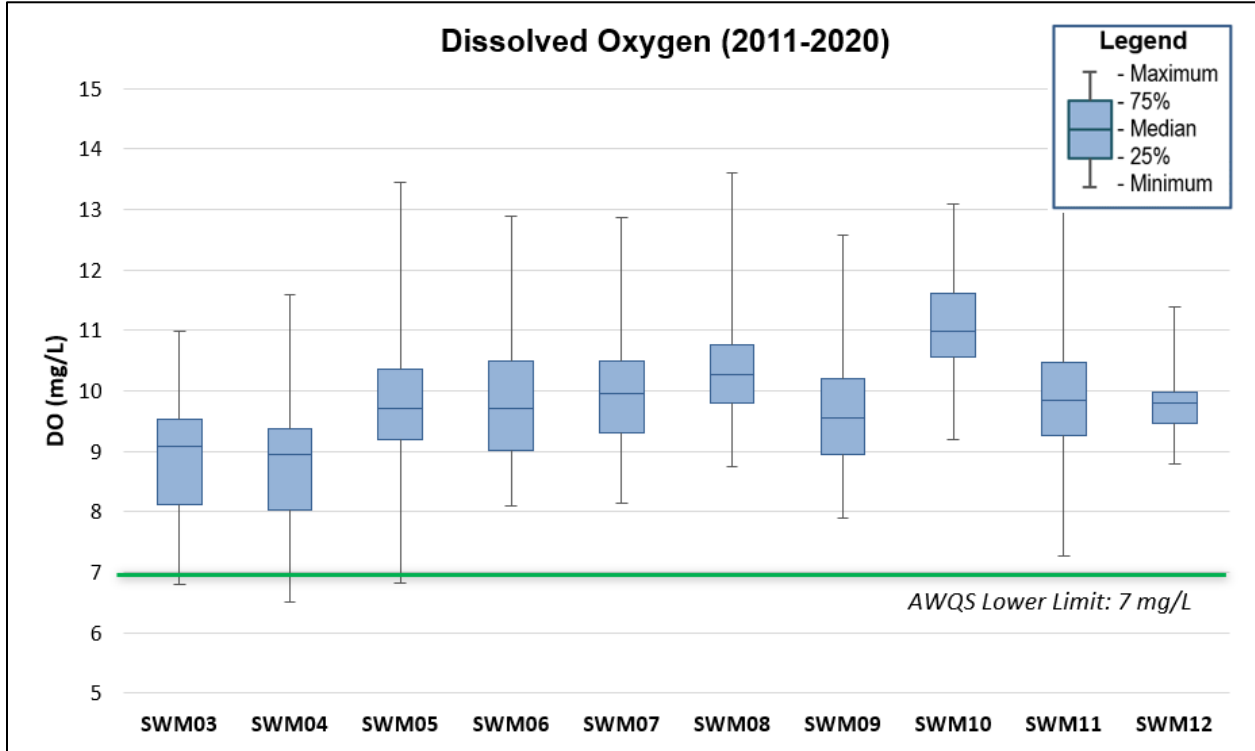
Figure 18. Station Box Plot of Temperature by Outfall, All Data 2011 through 2020



Review of the SWM Program data record indicates that there are significant differences in outfall temperature across at least some of the 10 outfalls tested. cursory observation of the box plot data (Figure 18) indicates that temperature readings tend to be lower at SWM03 and SWM10 than at the other outfalls. Similarly, SWM04 appears to trend warmer than other outfalls, and has a median temperature over two degrees Celsius higher than do SWM03 and SWM10. These

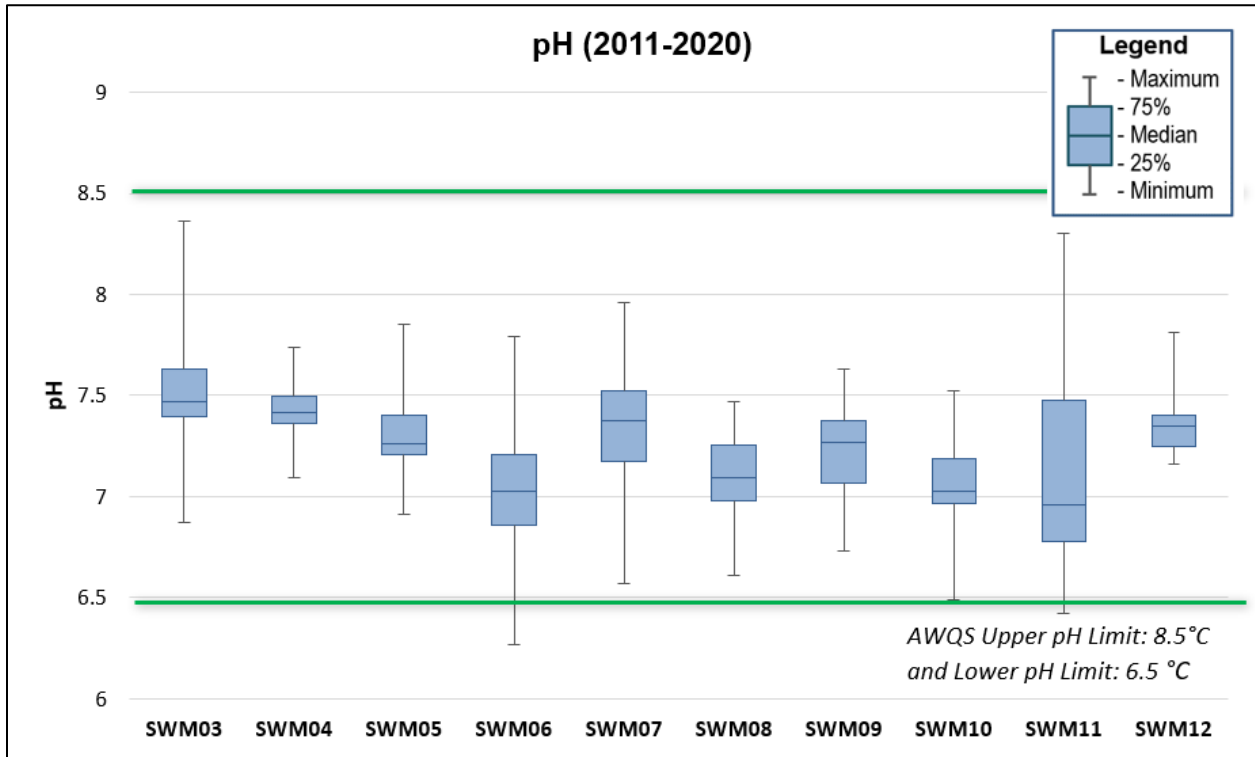
differences were found to be statistically significant (single factor ANOVA P-value of 0.0000061), supporting the conclusion that there are significant, persistent differences in temperature between at least some of the outfalls.

Figure 19. Station Box Plot of Dissolved Oxygen by Outfall, All Data 2011 through 2020



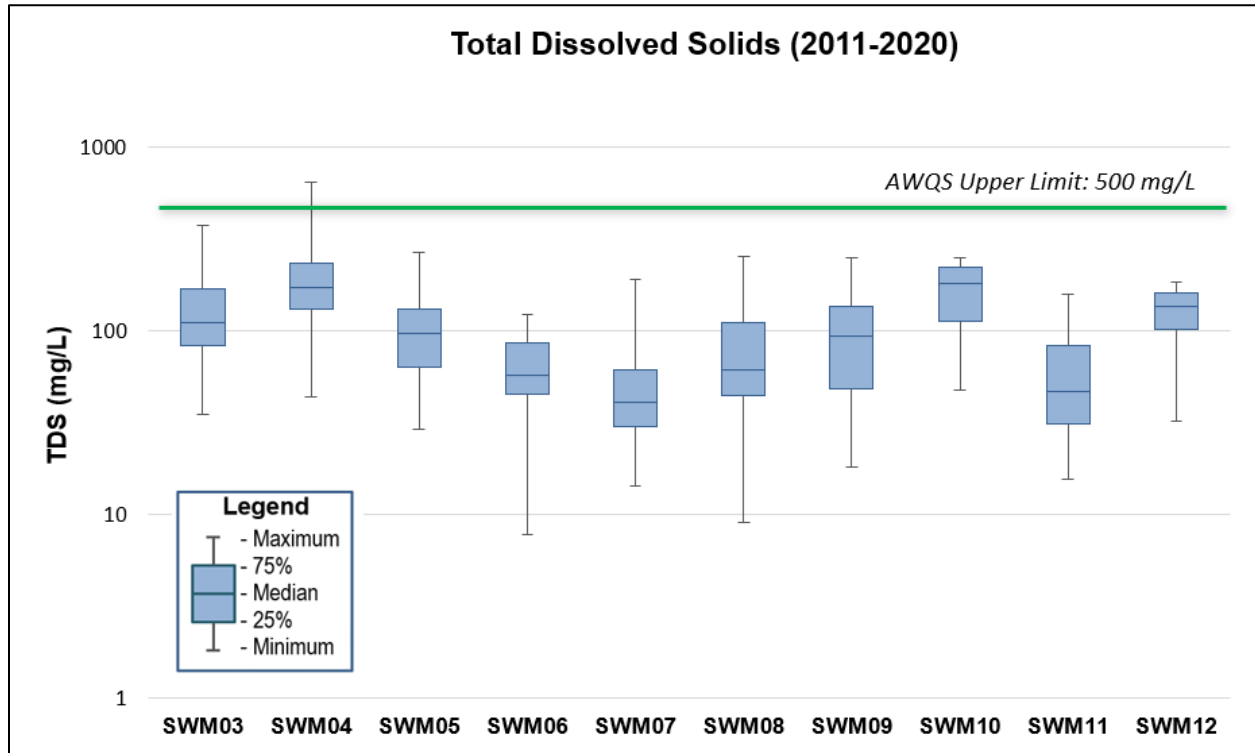
The box plot data record for DO is presented in Figure 19. Like temperature, DO concentrations are assumed to follow a normal distribution at each site. There is statistically significant variation between outfall sites (ANOVA p-value of 8.92×10^{-23}), but all sites generally are above the AWQS limit of 7mg/L. Throughout the data record, SWM10 has the greatest median DO concentration of 11.1 mg/L and is statistically distinct from each of the other outfall sites. The elevated DO at SWM10 is potentially due to persistently lower water temperatures and turbulent flow in the outfall pipe prior to discharge.

Figure 20. Station Box Plot of pH by Outfall, All Data 2011 through 2020



The median pH at outfalls SWM06, SWM8, SWM10, and SWM11 trends lower than at other outfalls with median values ranging from 6.96 to 7.095 (Figure 20). These four outfalls are statistically indistinguishable from one another with regards to mean pH (single factor ANOVA, P value of 0.55). There were several isolated individual measurements in the data record below the AWQS lower limit of 6.5 pH units, including one measurement in 2020 at SWM11 with a pH of 6.42 for Storm 3. Though SWM11 has the lowest median pH, these deviations below pH of 6.5 in the data appear to be incidental and not part of a broader trend. Outfall SWM03 had the highest median pH concentration (pH 7.47) in the data record. None of the samples collected in the data record exceed the upper AWQS pH criterion of 8.5 pH units.

Figure 21. Station Box Plot of Total Dissolved Solids by Outfall, All Data 2011 through 2020



The data record for TDS is presented in Figure 21. TDS levels trend highest at SWM04 and SWM10 with median values of 173.5 and 180.5 mg/L respectively over the ten-year monitoring record. It should be noted that median TDS levels for both SWM04 and SWM10 fall well below the AWQS criterion of 500mg/L. Only a single sample in the data record, collected in 2013 at SWM04, has ever exceeded the AWQS threshold. The comparatively elevated TDS at SWM04 and SWM10 may be an indication of pollutants such as fertilizer, salts, or organic ions flushing from the contributing drainage basins. Both outfalls drain primarily residential areas.

The box plots for TSS and turbidity are presented in Figure 22 and Figure 23, respectively. Over ten years of monitoring, both TSS and turbidity have been highly variable between storms and locations, although there is a general positive correlation between TSS and turbidity visible in the box plots. The highest median TSS and turbidity concentrations were detected at SWM07 and at SWM12, with median TSS and turbidity concentrations over double those of any of the other outfalls in the data record. Further statistical analysis was not performed. Outfall SWM10 exhibited the lowest median TSS and turbidity of the outfalls included in the 2020 SWM Program.

Figure 22. Station Box Plot of Total Suspended Solids by Outfall, All Data 2011 through 2020

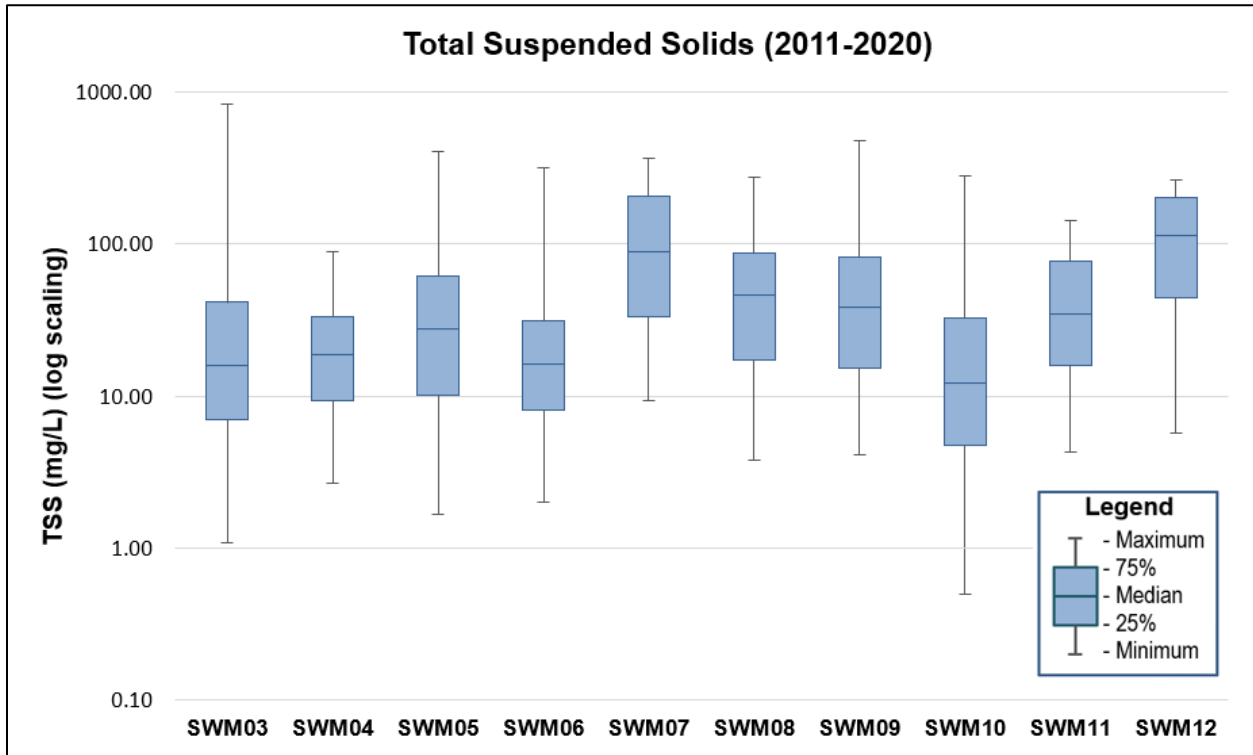


Figure 23. Station Box Plot of Turbidity by Outfall, All Data 2011 through 2020

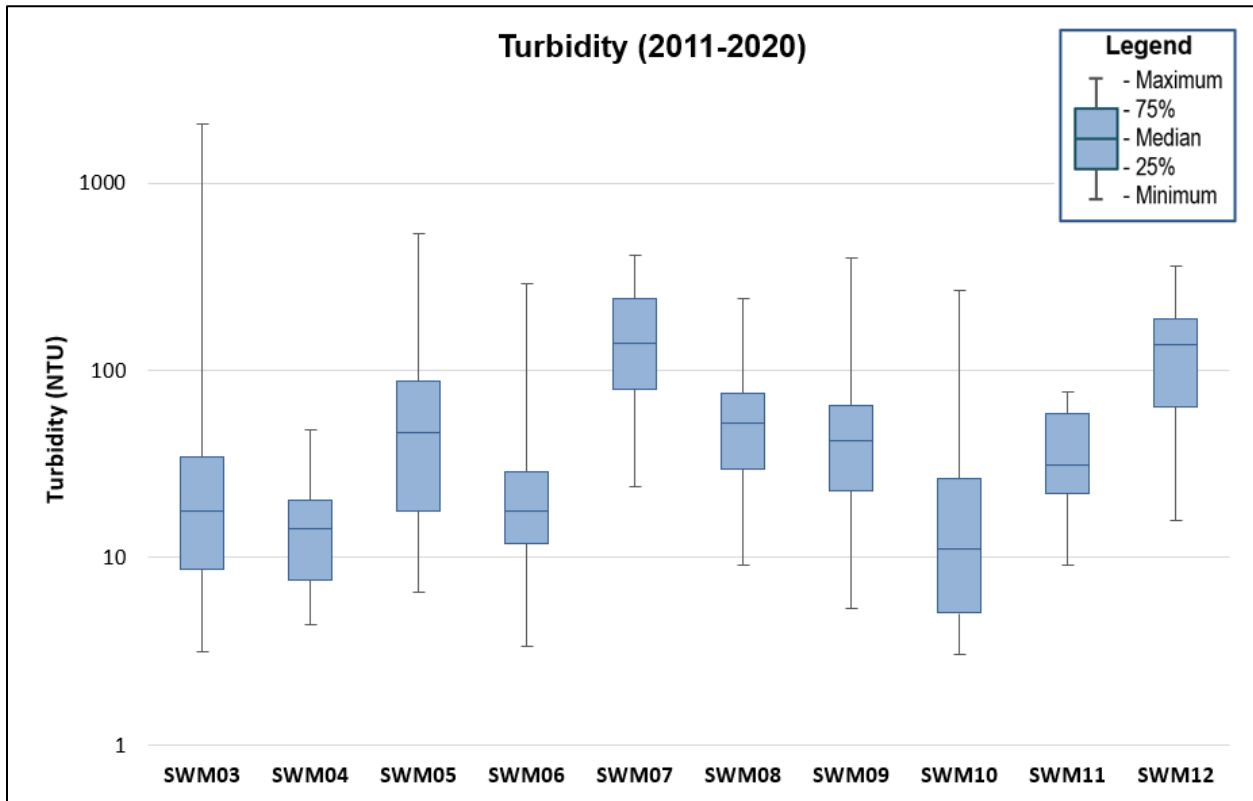
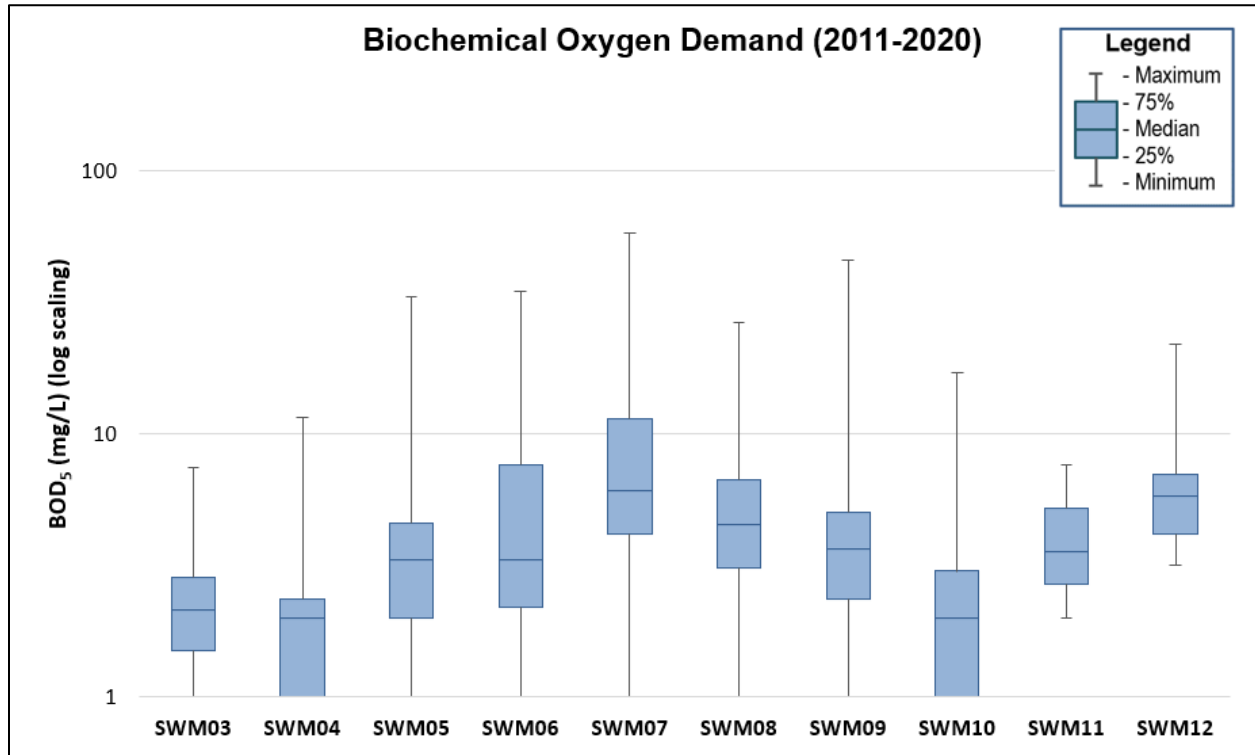
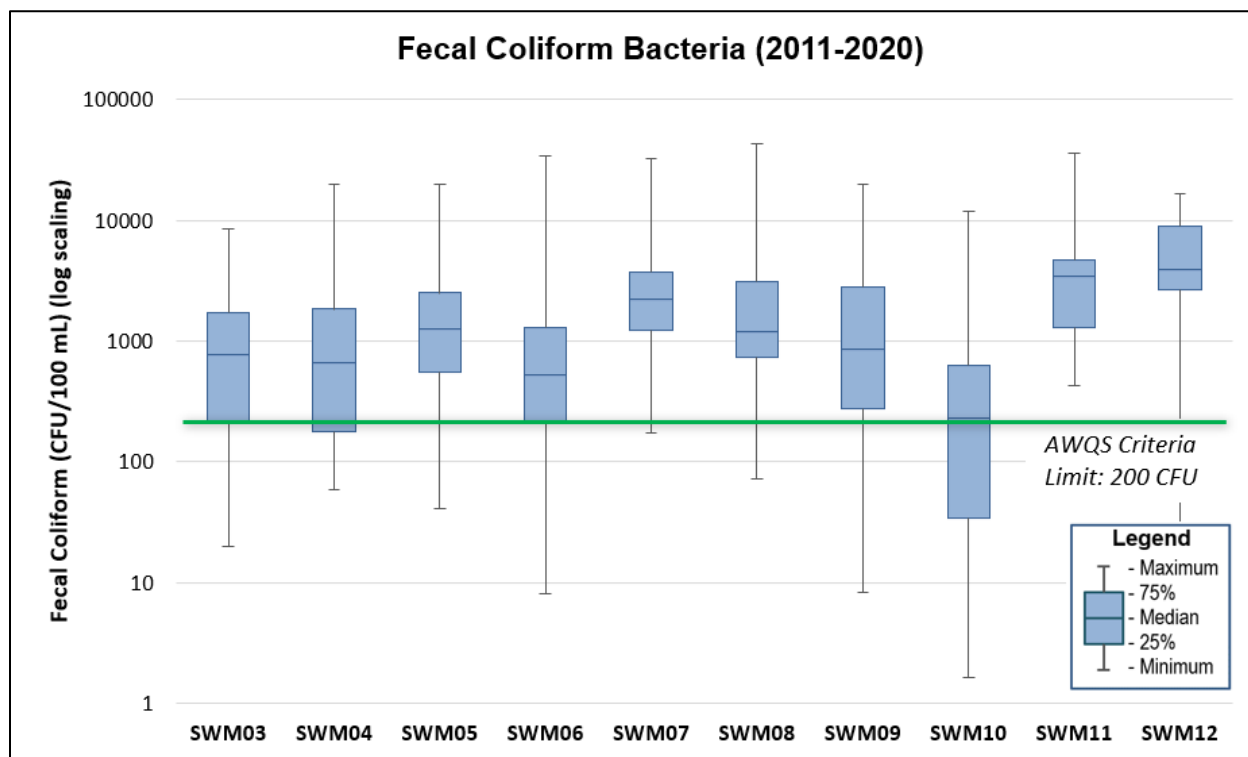


Figure 24. Station Box Plot of BOD₅ by Outfall, All Data 2011 through 2020



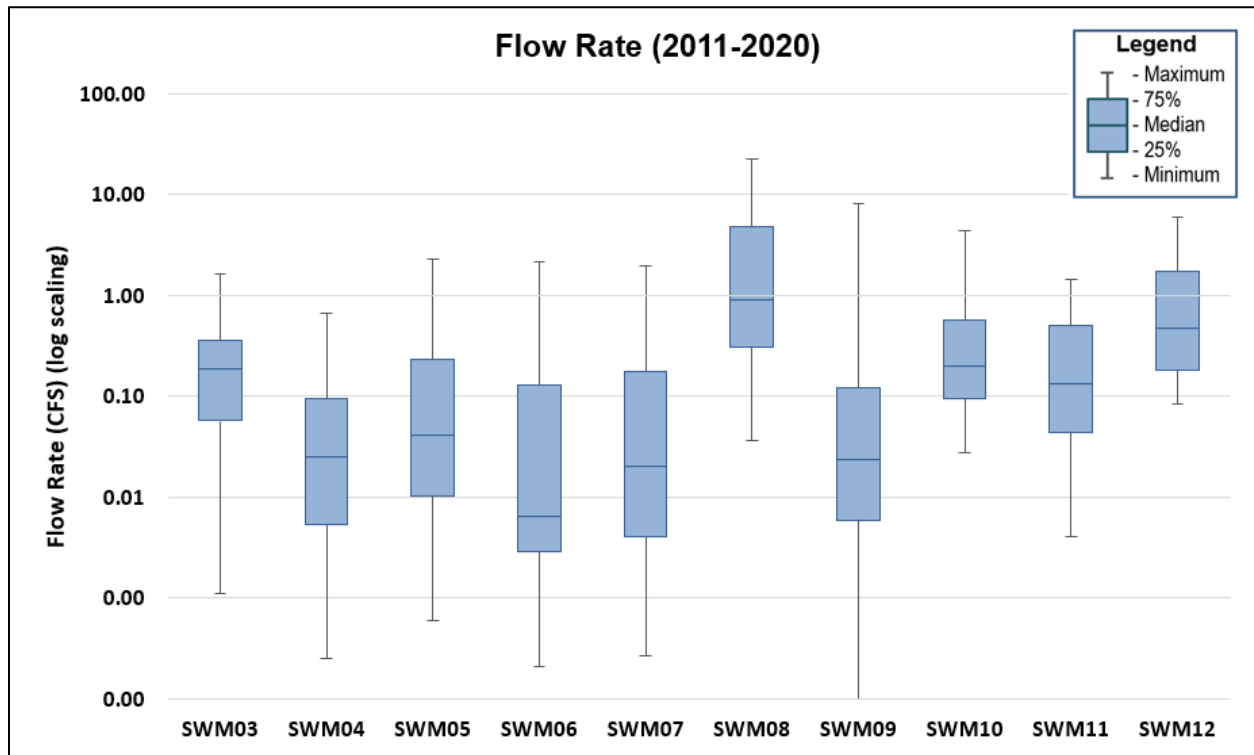
SWM07 had the highest median BOD₅ concentration seen throughout the data record (Figure 24). SWM12 is a close second to SWM07 with a median BOD₅ concentration of 5.77 mg/L. Historic mean BOD₅ concentrations at SWM07 and SWM12 are statistically indistinguishable (P value 0.31). The drainage areas for both outfalls include a high percentage of streets, parking lots, and other impervious surfaces. The elevated BOD₅ concentrations at these outfalls may be a result of vehicle cooling liquid inputs (glycols) from streets and driveways. SWM10 is one of the locations with the lowest BOD₅ concentrations.

Figure 25. Station Box Plot of Fecal Coliform Bacteria by Outfall, All Data 2011 through 2020



The box plot data record for fecal coliform is presented in Figure 25. Outfall sites SWM07, SWM11, and SWM12 have the highest median fecal coliform concentrations of the ten monitoring sites, with median concentrations of 2,200, 3,400 and 3,950 CFU/100mL respectively. The data record for SWM11 and SWM12 is only four years long, as opposed to ten years for the other outfalls, and further sampling will be required to monitor the trends at these outfalls. With four years of data, SWM12 is emerging as the site presenting the highest fecal coliform concentrations with statistically significant ($P=0.018$) higher average and median concentrations than SWM07. The sources of the higher concentrations seen at SWM07, SWM11, and SWM12 are unknown, but it is likely that the factors contributing to elevated fecal coliform measurements differ at each site. Other locations with elevated fecal coliform concentrations include SWM05 and SWM08. SWM10 consistently has the lowest fecal coliform concentrations, with a median concentration of 230 CFU/100mL.

Figure 26. Station Box Plot of Flow Rate by Outfall, All Data 2011 through 2020



The box plot for the flow rate data record is presented in Figure 26. Flow rate was highly variable between locations and between events, reflecting variability in both precipitation and basin characteristics throughout the monitoring corridor. For some outfalls, particularly for those with small drainage basins, flow rates responded rapidly to changes in precipitation. Outfall SWM08 drains the largest basin and has consistently higher flow rates than the other locations.

Box plots for hardness and dissolved copper concentrations are presented in Figure 27 and Figure 28 respectively. Hardness and copper were first added to the SWM Program in 2016, and as result these box plots represent a shorter five-year data record. There is a general inverse relationship visible between hardness and dissolved copper concentrations. SWM10 has the highest median hardness concentration and the lowest median dissolved copper concentrations among the 10 outfalls included in the SWM Program. Conversely, SWM07 had the lowest median hardness and the highest dissolved copper concentrations. However, in 2020, copper concentrations at SWM07 were generally lower than average based on historical data. No statistical analyses were performed on the basis of the shorter data record, and further monitoring will be required to see if these trends continue.

Figure 27. Station Box Plot of Hardness by Outfall, All Data 2016 through 2020

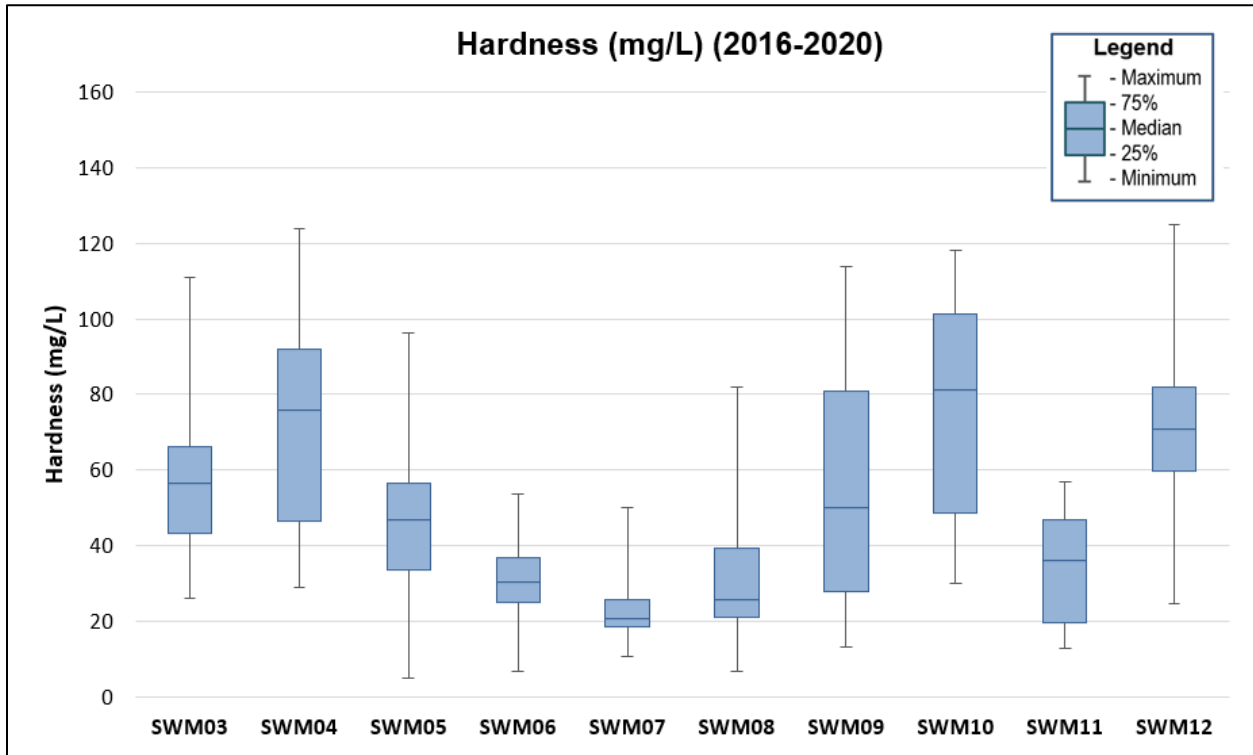
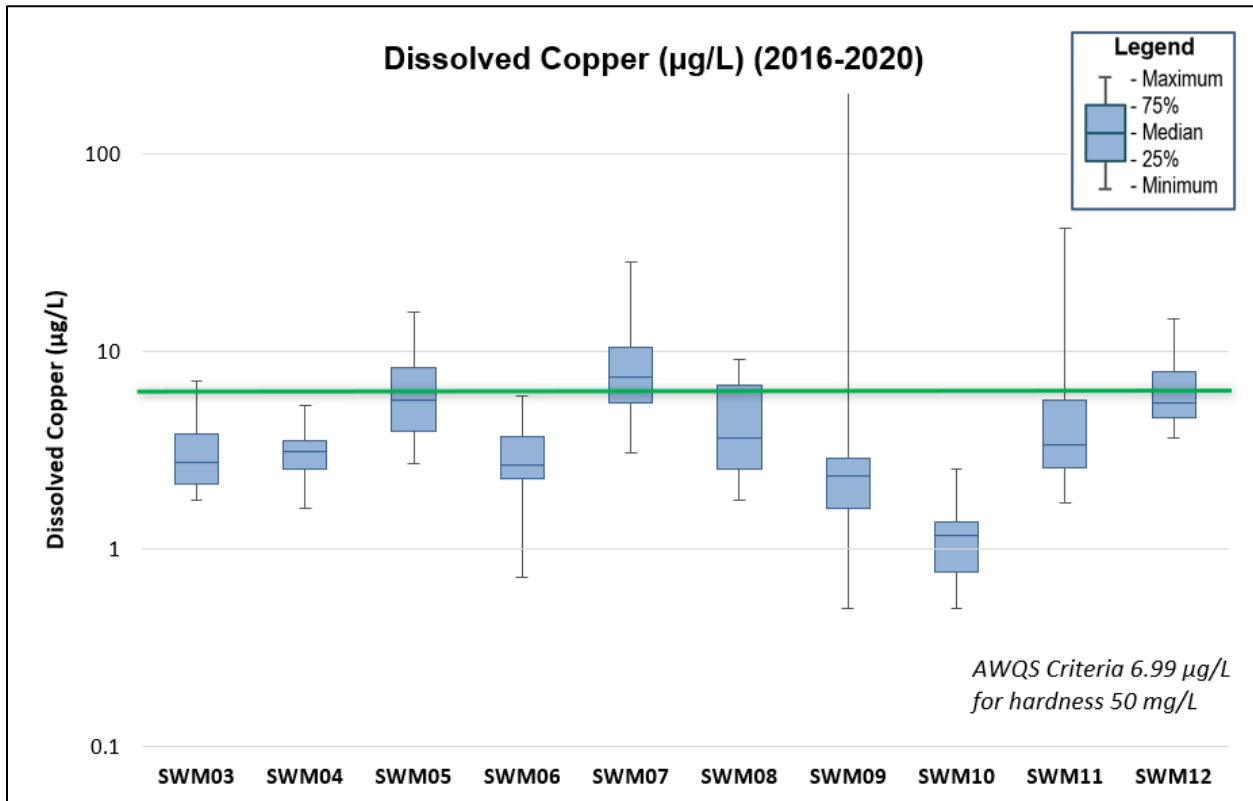


Figure 28. Station Box Plot of Dissolved Copper by Outfall, All Data 2016 through 2020



3.7 Seasonal and Yearly Trends

The SWM Program data record was examined for seasonal and yearly trends. The timing of outfall monitoring varies year-to-year depending on weather conditions and the timing of suitable storm events, and parameters can vary with season. Typically, sampling for the SWM Program begins in July and continues through September. The 2020 SWM Program first sampled August 11 and concluded on September 17, falling within a typical window for sampling based on prior monitoring years. In contrast, the prior 2019 SWM Program was unique due to the extreme drought conditions that persisted for much of the 2019 summer, and as result, monitoring occurred almost a month later than normal such that seasonal factors could influence the data. In 2020, the timing of the SWM Program was relatively normal such that seasonal impacts have less influence on the data.

Figure 29 presents the seasonal patterns for key parameters for the data record from 2011 through 2020, plotted against the day of the year. As expected, temperature fluctuates with season and was highest across all locations in July and August. DO fluctuates inversely to temperature, with the lowest DO concentrations during the summer months when temperatures are highest and increasing DO concentrations in the fall as water temperatures cool. Fecal coliform concentrations are not as highly correlated with season as are temperature and DO. It appears that fecal coliform concentrations may decrease in the fall months, though more data is needed to support this conclusion. Seasonal pattern regression values are presented on each plot where the data have been fitted to a third-order polynomial.

There are significant year-to-year fluctuations for various parameters tested, but there do not appear to be any significant broader trends evident in the data. For example, fecal coliform concentrations vary each monitoring year, with spikes in the data occurring seemingly at random at many of the outfalls throughout the data record. For example, there are spikes in the data (greater than 10,000 CFU/100mL) at two of the outfalls in 2016, six outfalls in 2017, five outfalls in 2018, zero outfalls in 2019 and one outfall in 2020. There is significant variability year to year in fecal coliform concentrations that can only partially be explained by seasonal patterns and does not appear to fit any long-term trends. Overall fecal coliform levels in 2020 were lower than the 2016-2018 period but slightly elevated from the 2019 levels.

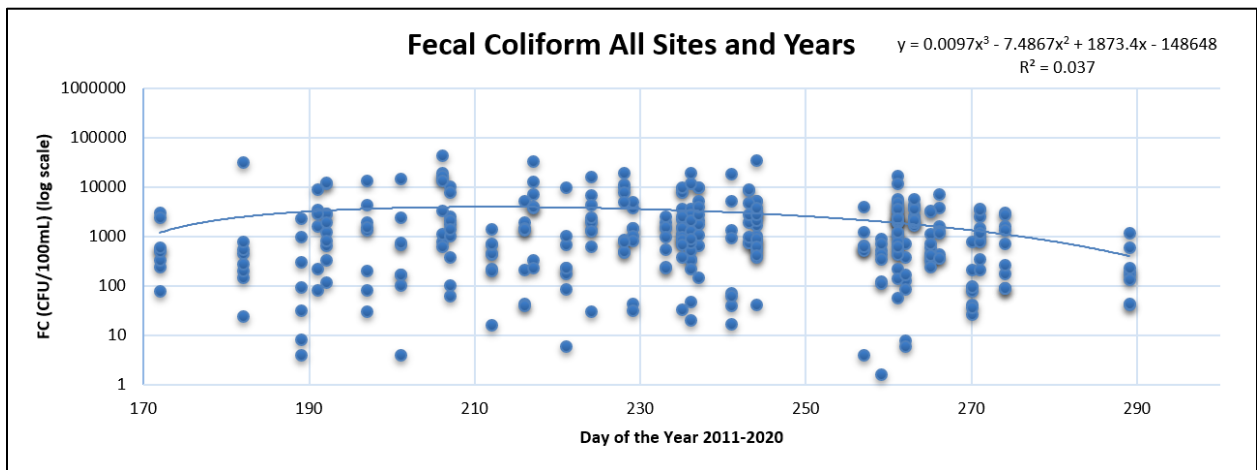
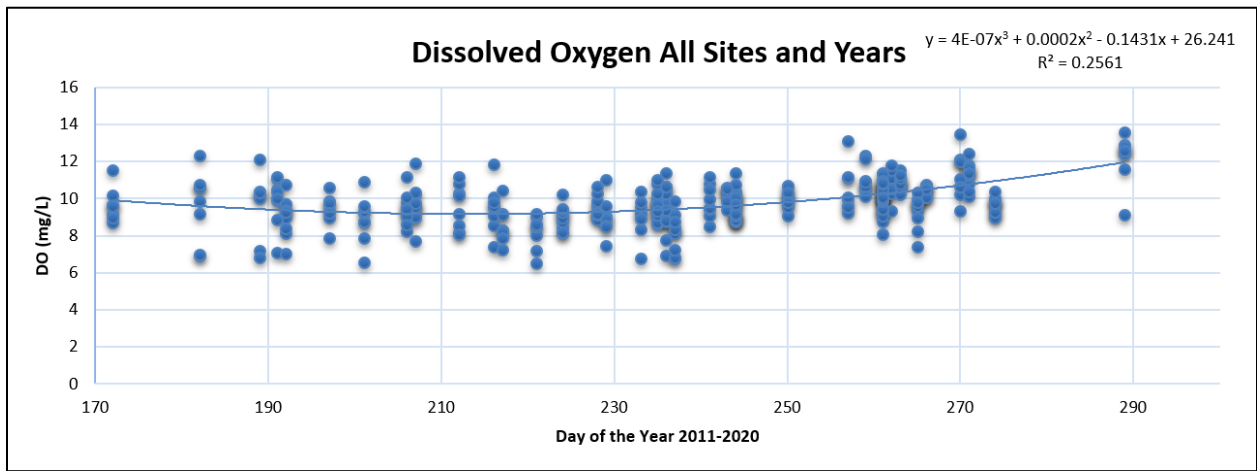
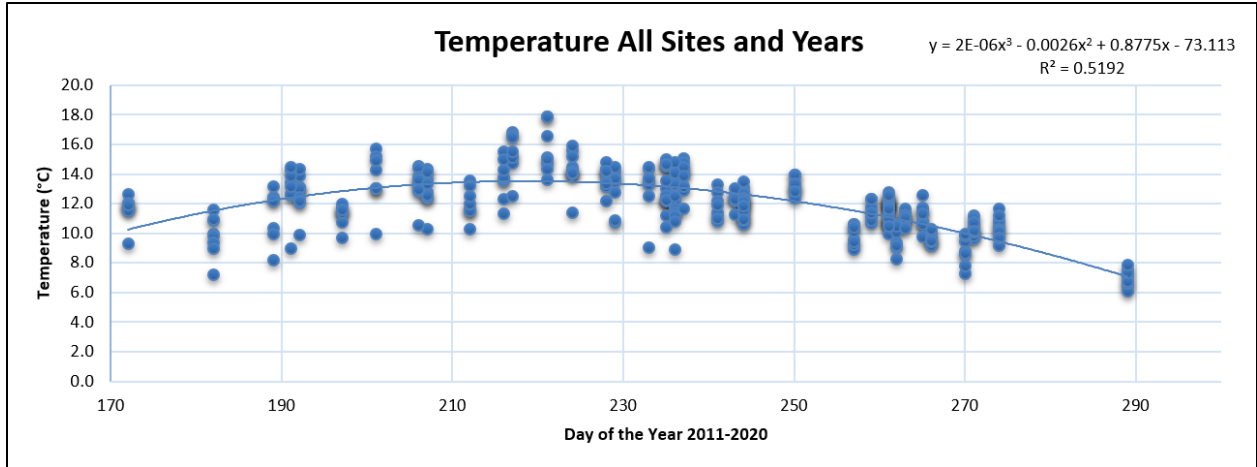


Figure 29. Seasonal Patterns for Temperature, DO, and Fecal Coliform, All Sites and All Years.

3.8 Annual Loading

Annual loadings for fecal coliform and hydrocarbons are presented in Figure 30 and Figure 31. These annual loadings are calculated using the Simple Method, which was developed under an EPA grant to provide Phase II communities with tools to protect their local watersheds (SMRC 2010). The Simple Method estimates stormwater runoff pollutant loads for urban areas based on the following parameters: subbasin drainage area and percent impervious cover, flow-weighted or event-mean stormwater runoff pollutant concentrations, and annual precipitation. Calculations are based on specific land uses (e.g., residential, commercial, industrial, roadways) to calculate annual pollutant loads for each land use type. The method can also be used for pollutant comparisons by more general land uses such as new suburban areas, older urban areas, central business districts, and highways. Equations and calculation methodology utilized for the Simple Method are detailed in Attachment B-1 of the QAP (MOA 2016).

A major limitation for this method is using a single grab sample for each storm event rather than using flow-weighted data. SMRC 2010 does not address the Simple Method's applicability to organic compounds such as petroleum hydrocarbons, even though comparisons are provided in this report. Therefore, the loading data presented here are considered estimates that may provide useful information for making general comparisons, but do not provide the precision required for detailed comparisons.

Annual loading estimates were developed for both fecal coliform and hydrocarbons. Fecal coliform loading calculations (Figure 30) utilized the annual geometric mean for each location to account for the high variability in fecal coliform counts. For hydrocarbons, both TPAH and TAH (as BTEX) were examined. The 2020 monitoring SWM Program includes TAH in the hydrocarbon loading analysis (TAH was first included in the 2019 analysis). Hydrocarbon loading calculations (Figure 31) utilize the annual arithmetic mean for each location.

The fecal coliform loading estimates generated through application of the Simple Method indicate a trend change in 2020. In 2020, fecal coliform loading at SWM07 continued a multi-year decline to the lowest level in five years. Historically, SWM07 has stood out as the subbasin with the highest annual fecal coliform loading, but after the five-year decline in estimated fecal coliform loading estimates, both SWM08 and SWM12 now carry higher load estimates than SWM07. SWM12 which represents a commercial/industrial land use area had the highest annual fecal coliform loading in 2020 with an estimate of 26.36 billion colonies/year. (SWM07 represents a commercial/industrial land use area while SWM08 represents a mixed land use area). The lowest fecal loading estimates were at SWM06 (residential) and SWM10 (mixed) with estimates of 1.889 and 1.527 billion colonies/year respectively.

Figure 30. Fecal Coliform Annual Loading by Monitoring Site

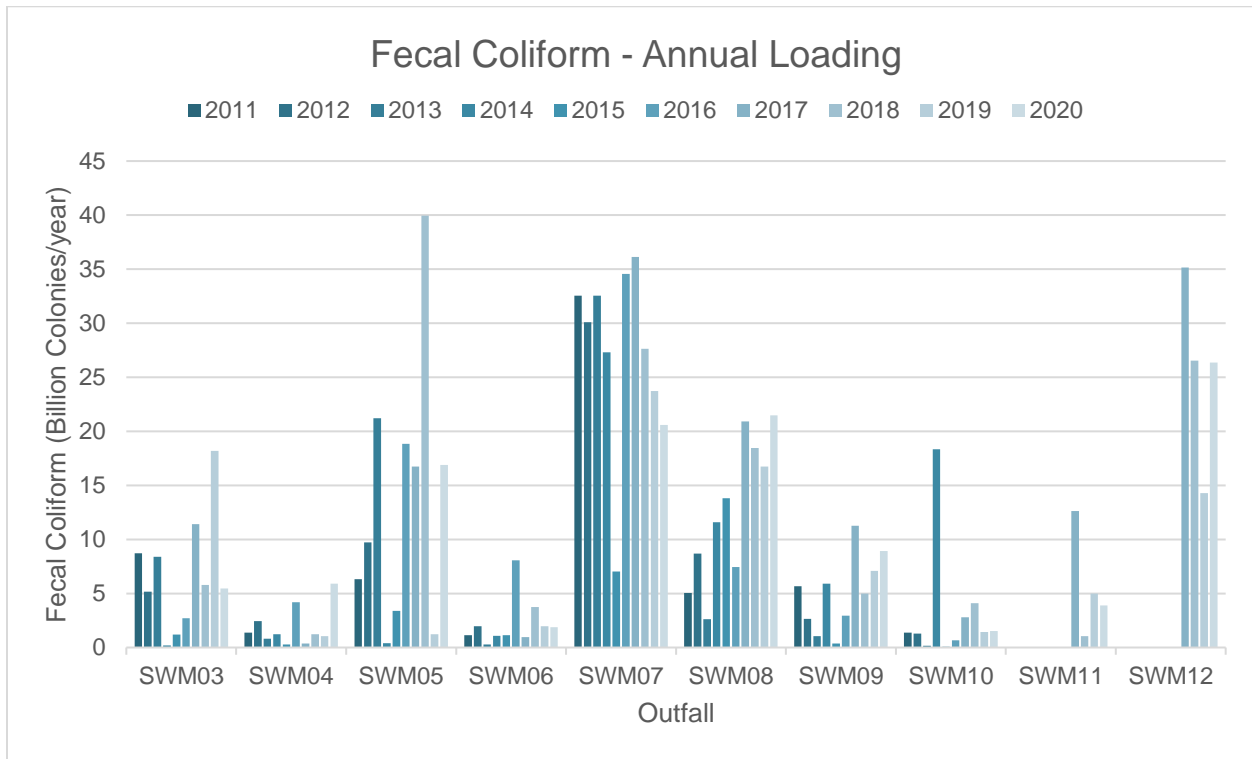
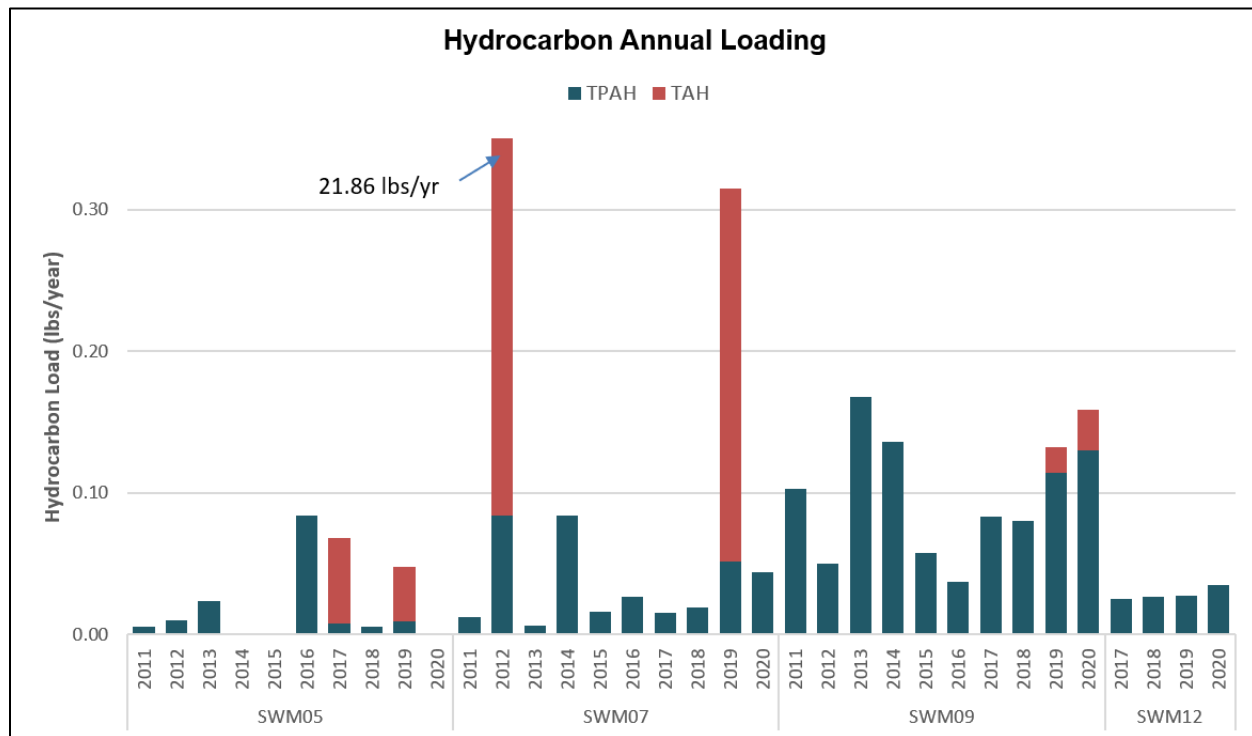


Figure 31. Hydrocarbon Annual Loading by Monitoring Site



Annual hydrocarbon loading estimates, as determined by TAH and TPAH measurements, were down in 2020 at SWM05 and SWM07, and slightly up at SWM09 and SWM12. Notably, there were no hydrocarbons detected in any of the samples at SWM05 for the first time since 2015. Hydrocarbon loading at SWM09 was up slightly in 2020. In general, the increased prevalence of hydrocarbon detection at SWM09 may reflect the increase in midweek traffic in the parking lot adjacent to the outfall during the summer of 2020 as result of MOA's COVID-19 mass shelter at the Sullivan Arena. Since monitoring activities typically occur midweek, and while there were fewer large weekend events held at the Sullivan Arena, there was an increase in midweek traffic and activity in the subbasin which could possibly account for the increase in hydrocarbon loading at SWM09.

In 2020, there was a general reduction in TAH detections as compared to the 2019 monitoring year. In 2019, TAH constituents were detected in 7 of the 16 samples collected for hydrocarbons, while in 2020, TAH constituents were detected in 4 of the 16 samples (all at SWM09 located adjacent to the Sullivan Arena). Prior to 2019, TAH constituents have been detected in only two samples in the SWM Program data record, once in 2012 at SWM07 (with an exceptionally high concentration) and once in 2017 at SWM05. The 2019 monitoring report surmised that the sudden increase in TAH detections in 2019 were related to the historic drought that occurred that summer. Hydrocarbons from fuels, oils, solvents, and other sources likely accumulated for many months over the course of the drought. The return of rain in September may have mobilized and flushed accumulated hydrocarbons through the storm sewer. The reduction in TAH detections in 2020 seems to confirm this assessment, though continued monitoring will be required to determine that the increase in TAH detections is not part of a broader trend.

4.0 Summary and Conclusions

This report details the findings of the 2020 Municipality of Anchorage (MOA) stormwater monitoring program (SWM Program), satisfying the requirements of the current municipal MS4 permit (Permit No. AKS-052558). The Anchorage MS4 permit establishes control measures and requires the development of programs designed to prevent contaminants from entering the storm sewer system. The permit further identifies monitoring objectives, including stormwater outfall monitoring (Section 4.1.7 of the MS4 permit). The stormwater outfall monitoring program monitors 10 priority outfall locations that represent a variety of major land use areas within the Anchorage Bowl. The SWM Program tests these outfall locations at least four times each year during storm events for specific physical and chemical parameters. The stormwater sampling conducted during 2020 represents the tenth year of outfall monitoring under the current SWM Program.

The 2020 SWM Program successfully sampled four storm events at the 10 priority outfall locations included in the monitoring program. The 2020 sampling events occurred on August 11, August 24, August 31, and September 17, 2020.

Overall, sample results fell generally within AWQS criteria and in line with the results of previous monitoring years. None of the samples tested present any immediate concerns for any of the tested parameters. The data record was investigated to look for systemic differences between outfall sites and for seasonal and multi-year trends.

Fecal coliform levels measured in the 2020 SWM Program fell within historical ranges for the program and were generally lower than those measured in 2016, 2017 and 2018. Fecal coliform levels were slightly elevated relative to 2019, though 2019 levels may have been biased low due to seasonal influences related to sampling one month later than normal that year. Annual loading calculations for fecal coliform in 2020 revealed the continuation of a slow five-year decline in fecal coliform loading at SWM07. For the 2020 SWM Program, SWM12 had the highest calculated annual fecal coliform loading estimate and SWM10 had the lowest calculated annual fecal coliform loading estimate in the analysis.

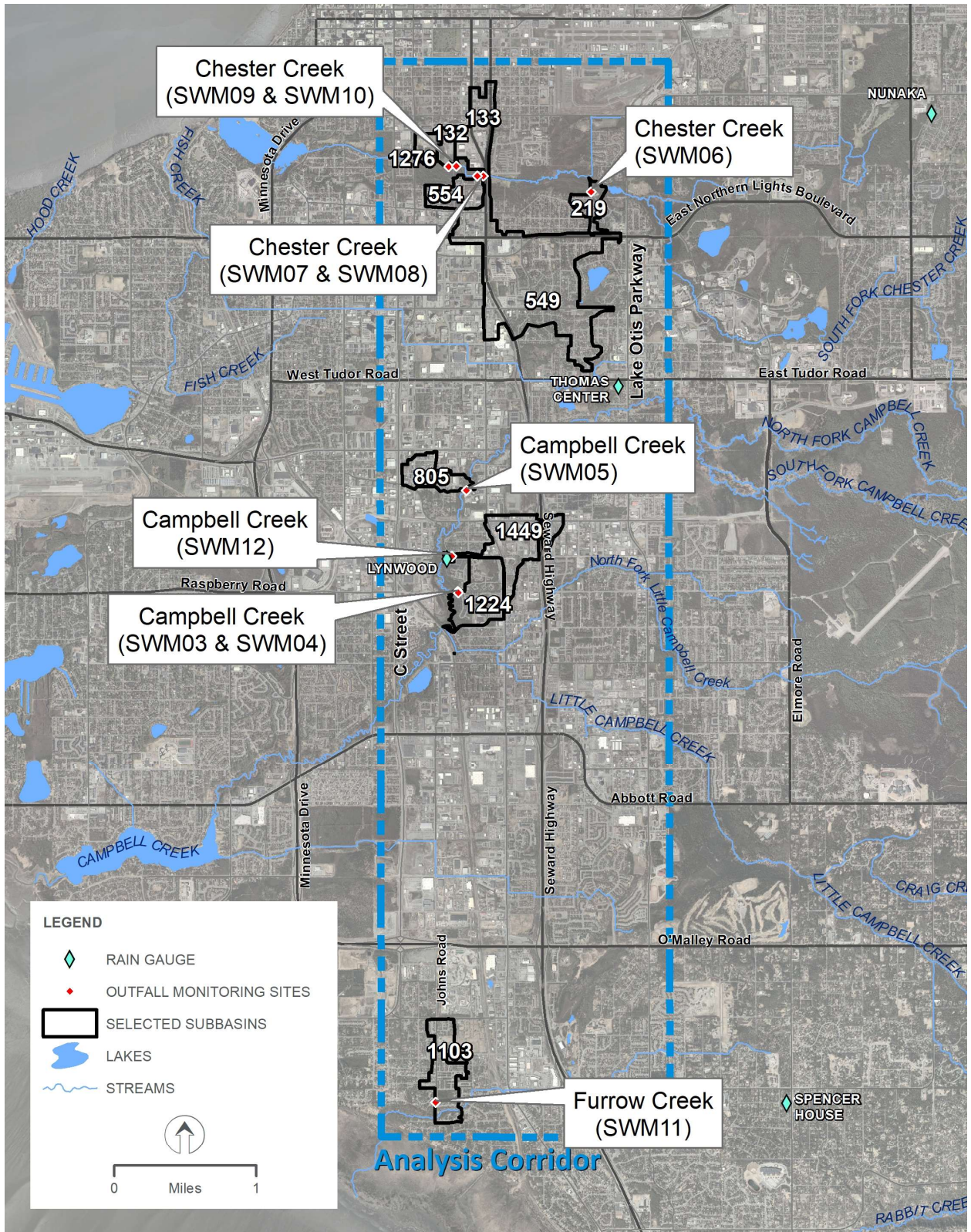
Annual hydrocarbon loading estimates for the 2020 SWM Program were decreased at SWM05 and SWM07, and slightly up at SWM09 and SWM12 relative to the 2019 monitoring year. All hydrocarbon measurements fell within historical ranges and below AWQS criteria. Hydrocarbon loading estimates were slightly increased at SWM09 with both TPAH and TAH detection in each of the four storms included in the SWM Program. The increase in hydrocarbon detection at SWM09 could be related to the increase in midweek traffic and activity in the parking lot adjacent to the outfall during the summer of 2020 as result of MOA's COVID-19 mass shelter at the Sullivan Arena. Detected concentrations were small, in each instance falling below AWQS criteria. There were no patterns in the data that present cause for concern or fall outside of historical norms.

5.0 References

- ACCAP 2019. Alaska Center for Climate Assessment and Policy, University of Alaska Fairbanks. Accessed at <https://uaf-accap.org/> on December 16, 2019.
- ADEC 2004a. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in the Waters of Little Campbell Creek in Anchorage, Alaska. Final - March 2004.
- ADEC 2004b. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in the Waters of Furrow Creek in Anchorage, Alaska. Final - March 2004.
- ADEC 2005. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in Chester Creek, University Lake, and Westchester Lagoon, Anchorage, Alaska. Final - May 2005.
- ADEC 2006. Total Maximum Daily Loads (TMDLs) for Fecal Coliform Bacteria in the Waters of Campbell Creek and Campbell Lake in Anchorage, Alaska. Final - May 2006.
- ADEC 2008. Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances. State of Alaska Department of Environmental Conservation.
- ADEC 2009. Water Quality Standards, 18 AAC 70. State of Alaska Department of Environmental Conservation.
- ADEC 2015a. Authorization to Discharge under the Alaska Pollutant Discharge Elimination System, Permit No. Anchorage Municipal Separate Storm Sewer System, Individual Permit AKS052558. Permit Issued to the Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities. June 26, 2015.
- ADEC 2015b. Fact Sheet for APDES Permit No. AKS-052558. May 5, 2015.
- ADEC 2018. State of Alaska 2014/2016 Final Integrated Water Quality Monitoring and Assessment Report. November 2, 2018.
- ADN 2020. Sullivan Arena Mass Shelter New Articles: “Sullivan Arena will be used as shelter for Anchorage homeless as city braces for coronavirus cases” published March 16, 2020; “Sullivan Arena likely to operate as mass shelter for foreseeable future, Anchorage official says” published August 2020. Accessed at <https://www.adn.com/>.
- AWC 2014. Chester Creek Watershed Plan, Draft. Prepared for the Municipal Planning Department and Watershed Management Services. Prepared by Anchorage Waterways Council.
- EPA 1983. Results of the Nationwide Urban Runoff Program. Water Planning Division, PB 84-185552, Washington, D.C., December 1983.
- EPA 2009. Authorization to Discharge under the National Pollutant Discharge Elimination System, Permit No. AKS-052558. Permit Issued to the Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities. October 29, 2009.

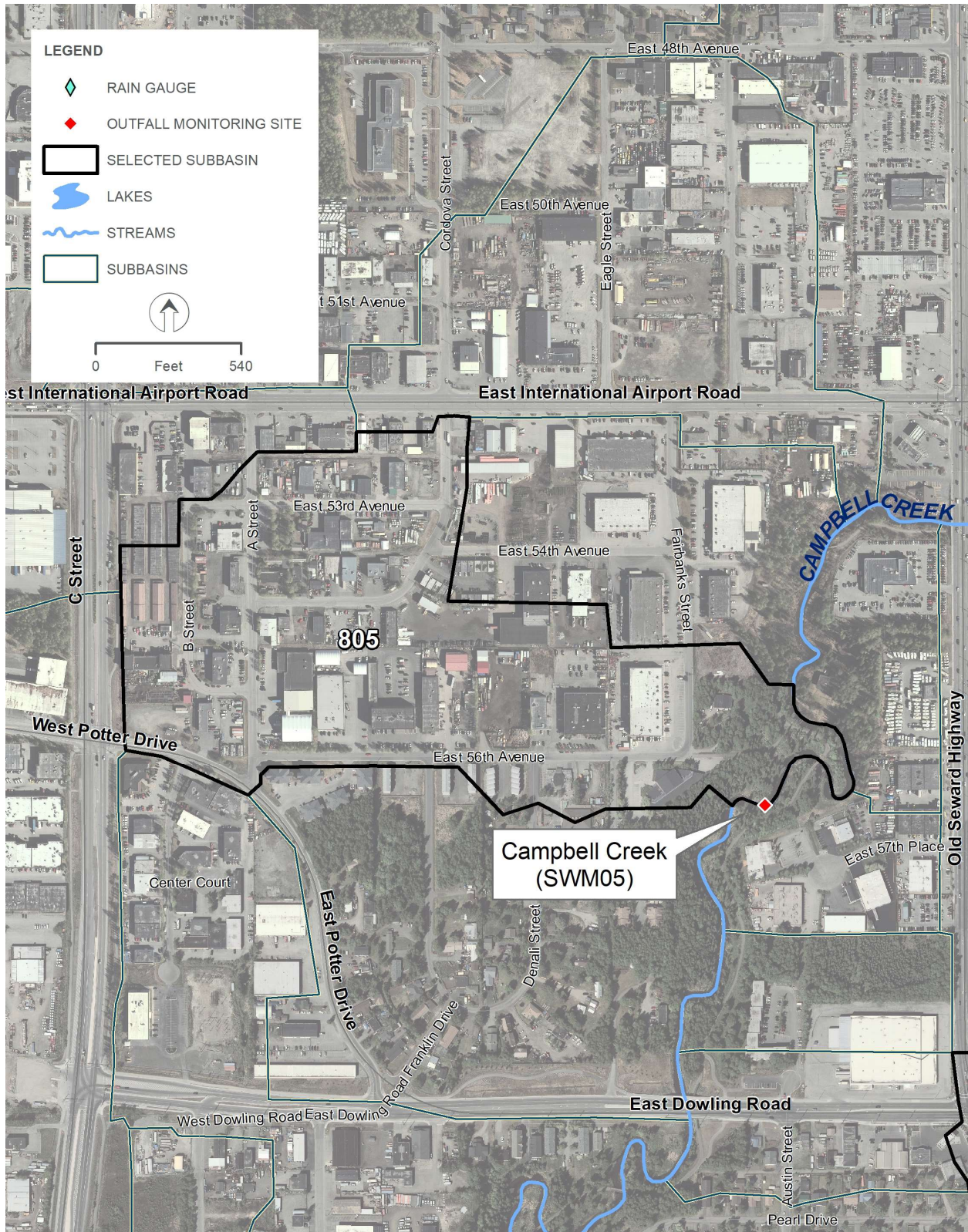
- MOA 2003. Fecal Coliform in Anchorage Streams: Sources and Transport Processes. Document APg03001. September 2003.
- MOA 2016. Monitoring, Evaluation, and Quality Assurance Plan, APDES Permit No. AKS-052558. Prepared for Alaska Department of Environmental Conservation, Division of Water. Prepared by HDR Alaska, Inc. and Municipality of Anchorage. 2016.
- NADP 2018. National Atmospheric Deposition Program 2017 Annual Summary. Wisconsin State Laboratory of Hygiene, University of Wisconsin-Madison, WI. 2017.
- NOAA 2016. National Oceanic and Atmospheric Administration. Monthly Precipitation Normals for Ted Stevens Anchorage International Airport, 1981-2010. Accessed at <https://www.ncdc.noaa.gov/cdo-web/> on November 30, 2020.
- NOAA 2020. National Oceanic and Atmospheric Administration National Centers for Environmental Information. Accessed at <https://www.ncdc.noaa.gov/cdo-web/>.
- NWS 2020a. National Weather Service, Weather Conditions For: KTUA2 Anchorage Midtown, AK. Accessed at <https://www.wrh.noaa.gov/mesowest/timeseries.php?wfo=arh&num=24&sid=KTUA2>.
- NWS 2020b. National Weather Service Forecast office, Anchorage, AK. Monthly Weather Summary. Anchorage. Data downloaded from <https://w2.weather.gov/climate/index.php?wfo=pafc> on December 2, 2020.
- SMRC 2010. Stormwater Managers Resource Center. Monitoring and Assessment Guidance, The Simple Method. Website: <http://www.stormwatercenter.net>
- USGS 2006. Water-Quality Conditions of Chester Creek, Anchorage, Alaska, 1998-2001. Scientific Investigations Report 2006-5229.

Appendix A
Outfall Site Maps



MOA STORMWATER OUTFALL MONITORING
TEN PRIORITY OUTFALL MONITORING SITES
FIGURE 1

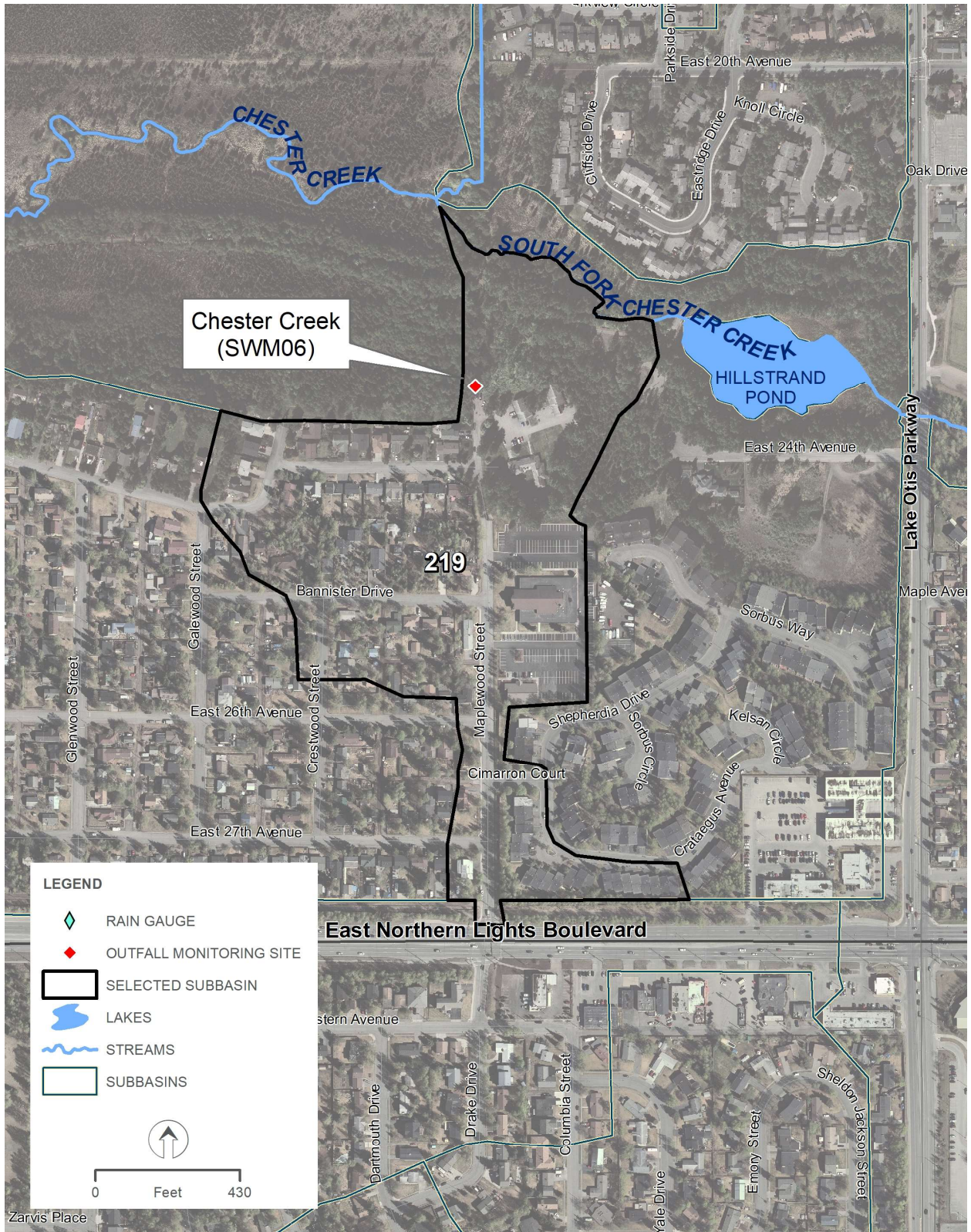
PATH: Z:\07064 ANCH DPW\10116087_STORMWATER OUTFALL MONITORING 2018\7.2_WP\MAP_DOCS\2020 UPDATE\MODERN\MOA_STORMWATER_RAINGAUGES_WETWTHRSTNS.MXD - USER: SNORTON - DATE: 11/11/2020



**MOA STORMWATER OUTFALL MONITORING
SAMPLING STATION SWM05, UPDATED SUBBASIN 805**

FIGURE 2

PATH: Z:\07064 ANCH DPW\10116087_STORMWATER OUTFALL MONITORING 2018\7.2_WP\MAP_DCS\2020 UPDATE\MODERN\MOA_STORMWATER_WET\THRS\TNS.SWM05.MXD - USER: SNORTON - DATE: 11/11/2020

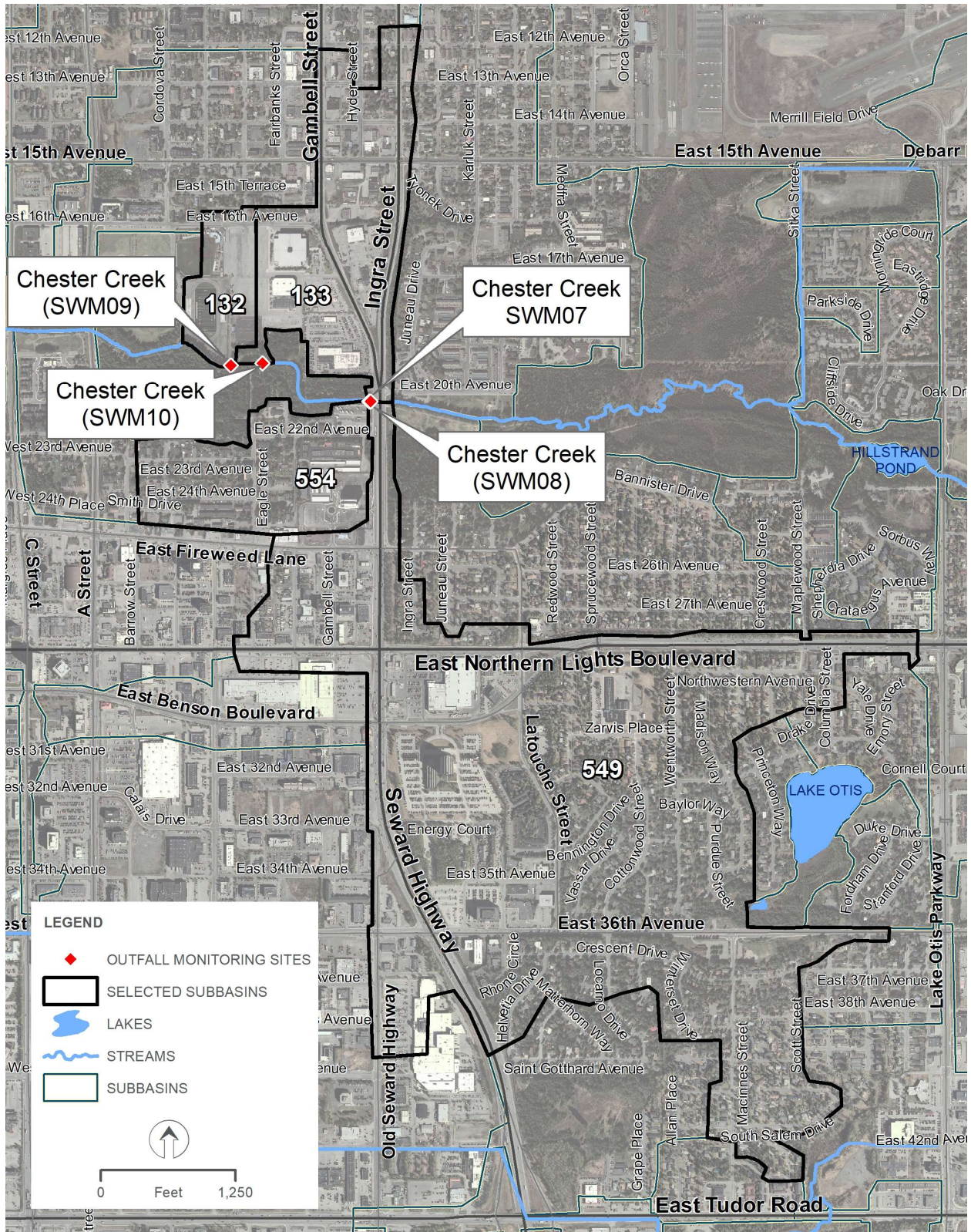


MOA STORMWATER OUTFALL MONITORING SAMPLING STATION SWM06, UPDATED SUBBASIN 219

FIGURE 3

WATERSHED MANAGEMENT

PATH: Z:\07064 ANCH DPW\10116087_STORMWATER OUTFALL MONITORING\2018\7_2_WP\MAP_DOC\2020 UPDATE\MODERN\MOA_STORMWATER_WET\THRS TNS.SWM06.MXD - USER: SNORTON - DATE: 11/11/2020



MOA STORMWATER OUTFALL MONITORING SAMPLING STATIONS SWM07, SWM08, SWM09 AND SWM10, UPDATED SUBBASINS 132, 133, 549, AND 554

FIGURE 4



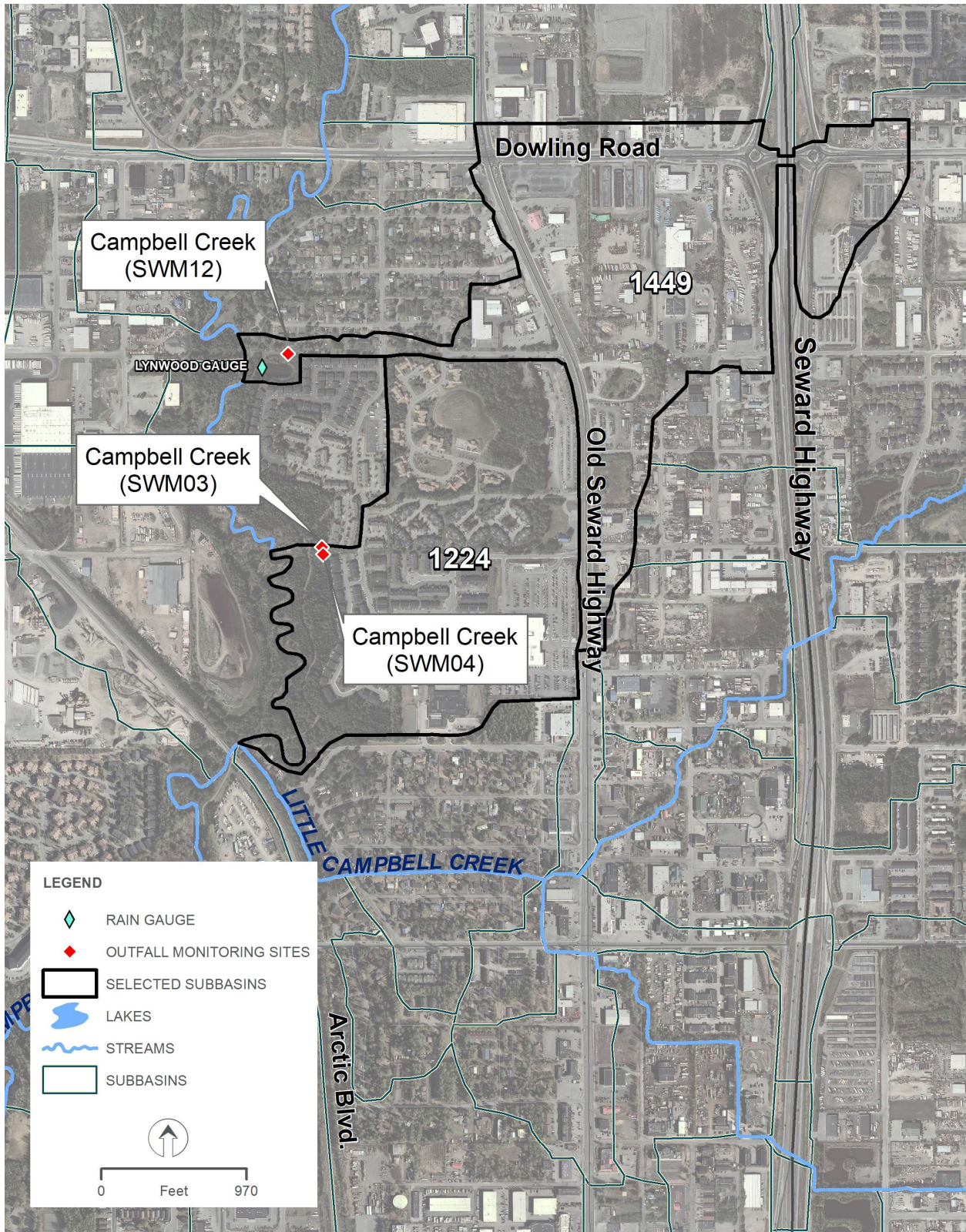
PATH: Z:\07064 ANCH DPW\10116087_STORMWATER OUTFALL MONITORING 2018\7.2_WP\MAP_DOC\SI2020 UPDATE\MODERN\MOA_STORMWATER_WET\THRS\TNS.SWM08.MXD - USER: SNORTON - DATE: 11/11/2020



**MOA STORMWATER OUTFALL MONITORING
SAMPLING STATION SWM11, UPDATED SUBBASIN 1103**

FIGURE 5

PATH: Z:\107064 ANCH DPW\10116087_STORMWATEROUTFALLMONITORING2018\7.2_WP\MAP_DOCS\2020 UPDATE\MODERN\MOA_STORMWATER_WETWTHRS.TNS.SWM11.MXD - USER: SNORTON - DATE: 11/11/2020



**MOA STORMWATER OUTFALL MONITORING
SAMPLING STATIONS SWM03, SWM04, AND SWM12,
UPDATED SUBBASINS 1103 AND 1449** **FIGURE 6**

PATH: Z:\07064 ANCH DPW\10116087_STORMWATEROUTFALLMONITORING2018\7.2_WPMAP_DOC\2020 UPDATE\MODERN\MOA_STORMWATER_WETWTHRS.TNS.SMW12.MXD - USER: SNORTON - DATE: 11/11/2020

Appendix B

Photographs



Photograph 1. Outfall SWM03 (1224-1), Fairweather Loop off Sylvan Drive.



Photograph 2. Outfall SWM04 (1224-2), Fairweather Loop off Sylvan Drive.



Photograph 3. Outfall SWM05 (207-1), East 56th Avenue at Save School.



Photograph 4. Outfall SWM06 (314-22), Maplewood Street off of Northern Lights Boulevard.



Photograph 5. Outfall SWM07 (484-1), New Seward Highway at Chester Creek.



Photograph 6. Outfall SWM08 (86-1), New Seward Highway at Chester Creek.



Photograph 7. Outfall SWM09 (499-1), Anchorage Football Stadium & Ben Boeke Ice Arena.



Photograph 8. Outfall SWM10 (525-2), Eagle Street at Chester Creek.



Photograph 9. Outfall SWM11 (348-3), Johns Road at Botanical Circle.



Photograph 10. Outfall SWM12 (1454-1), Lynwood Retention Basin.

Appendix C
Laboratory Data Packages & Chain of Custodies

Appendix C1
Laboratory Data Package
Storm Event #1



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
2525 C Street, #500
Anchorage, AK 99503
(907)644-2017

Report Number: **1204120**

Client Project: **10227978 MOA StmWtr Outfall M**

Dear Cynthia Helmericks,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1204120**
Project Name/Site: **10227978 MOA StmWtr Outfall M**
Project Contact: **Cynthia Helmericks**

Refer to sample receipt form for information on sample condition.

SWM 12-01 BDUP (1204120014) BDUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Refer to LCS/LCSD RPD for batch precision.

SWM 12-01 MS (1204120012) BMS

8270D SIM - PAH BMS recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

SWM 12-01 MSD (1204120013) BMSD

8270D SIM - PAH BMSD recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

8270D SIM - PAH BMS/BMSD RPD for several analytes do not meet QC criteria. Results for this analyte are considered estimated in the parent sample.

1204120011DUP (1575149) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Refer to LCS/LCSD RPD for batch precision.

1204237001DUP (1575150) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. The difference between sample and duplicate results is less than the LOQ.

1204120011MS (1574746) MS

8270D SIM - PAH MS recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1204120011MSD (1574747) MSD

8270D SIM - PAH MSD recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

8270D SIM - PAH MS/MSD RPD for several analytes do not meet QC criteria. Results for this analyte are considered estimated in the parent sample.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 09/08/2020 3:55:35PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
SWM 03-01	1204120001	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 04-01	1204120002	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 05-01	1204120003	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 06-01	1204120004	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 07-01	1204120005	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 08-01	1204120006	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 08-01 Dup	1204120007	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 09-01	1204120008	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 10-01	1204120009	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 11-01	1204120010	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01	1204120011	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 MS	1204120012	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 MSD	1204120013	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 BDUP	1204120014	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 DUP	1204120015	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM-TMpB-01	1204120016	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 03-01	1204120017	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 04-01	1204120018	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 05-01	1204120019	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 06-01	1204120020	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 07-01	1204120021	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 08-01	1204120022	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 08-01 Dup	1204120023	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 09-01	1204120024	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 10-01	1204120025	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 11-01	1204120026	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01	1204120027	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 MS	1204120028	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 MSD	1204120029	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)
SWM 12-01 Dup	1204120030	08/11/2020	08/11/2020	Water (Surface, Eff., Ground)

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
<u>Method</u>	<u>Method Description</u>			
EPA 602/624	602 Aromatics by 624 (W)			
EPA 625M SIM (PAH) LV	625 PAH SIM GC/MS Low Volume			
SM21 5210B	Biochemical Oxygen Demand SM21 5210B			
SM21 9222D	Fecal Coliform (MF)			
SM21 2340B	Hardness as CaCO3 by ICP-MS			
EP200.8	Metals in Drinking Water by ICP-MS DISSO			
EP200.8	Metals in Water by 200.8 ICP-MS			
SM21 2540D	Total Suspended Solids SM20 2540D			

Print Date: 09/08/2020 3:55:39PM

Detectable Results Summary

Client Sample ID: **SWM 03-01**

Lab Sample ID: 1204120001

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	11500	ug/L
Hardness as CaCO ₃	43.7	mg/L
Magnesium	3630	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	2.62	mg/L
Fecal Coliform	2100	col/100mL
Total Suspended Solids	17.0	mg/L

Waters Department

Client Sample ID: **SWM 04-01**

Lab Sample ID: 1204120002

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	18900	ug/L
Hardness as CaCO ₃	68.1	mg/L
Magnesium	5110	ug/L

Microbiology Laboratory

Fecal Coliform	6900	col/100mL
Total Suspended Solids	8.80	mg/L

Waters Department

Client Sample ID: **SWM 05-01**

Lab Sample ID: 1204120003

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	10600	ug/L
Hardness as CaCO ₃	36.4	mg/L
Magnesium	2410	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	3.58	mg/L
Fecal Coliform	1390	col/100mL
Total Suspended Solids	17.8	mg/L

Waters Department

Client Sample ID: **SWM 06-01**

Lab Sample ID: 1204120004

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	8100	ug/L
Hardness as CaCO ₃	30.0	mg/L
Magnesium	2390	ug/L

Microbiology Laboratory

Fecal Coliform	640	col/100mL
Total Suspended Solids	7.00	mg/L

Waters Department

Client Sample ID: **SWM 07-01**

Lab Sample ID: 1204120005

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	4590	ug/L
Hardness as CaCO ₃	19.3	mg/L
Magnesium	1910	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	6.01	mg/L
Fecal Coliform	2000	col/100mL
Total Suspended Solids	35.0	mg/L

Waters Department

Detectable Results Summary

Client Sample ID: **SWM 08-01**

Lab Sample ID: 1204120006

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7350	ug/L
Hardness as CaCO3	25.2	mg/L
Magnesium	1660	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	2.75	mg/L
Fecal Coliform	1300	col/100mL
Total Suspended Solids	17.2	mg/L

Waters Department

Client Sample ID: **SWM 08-01 Dup**

Lab Sample ID: 1204120007

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7330	ug/L
Hardness as CaCO3	25.2	mg/L
Magnesium	1680	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	2.90	mg/L
Fecal Coliform	2300	col/100mL
Total Suspended Solids	16.6	mg/L

Waters Department

Client Sample ID: **SWM 09-01**

Lab Sample ID: 1204120008

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	13500	ug/L
Hardness as CaCO3	45.6	mg/L
Magnesium	2850	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	4.40	mg/L
Fecal Coliform	2400	col/100mL

Polynuclear Aromatics GC/MS

Fluoranthene	0.0886	ug/L
Pyrene	0.0633	ug/L
Toluene	0.329J	ug/L
Total Suspended Solids	10.2	mg/L

Volatile GC/MS

Waters Department

Client Sample ID: **SWM 10-01**

Lab Sample ID: 1204120009

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	30600	ug/L
Hardness as CaCO3	107	mg/L
Magnesium	7410	ug/L

Microbiology Laboratory

Fecal Coliform	30	col/100mL
----------------	----	-----------

Waters Department

Total Suspended Solids	2.80	mg/L
------------------------	------	------

Client Sample ID: **SWM 11-01**

Lab Sample ID: 1204120010

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	4440	ug/L
Hardness as CaCO3	17.0	mg/L
Magnesium	1450	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	4.10	mg/L
Fecal Coliform	4400	col/100mL

Waters Department

Total Suspended Solids	72.0	mg/L
------------------------	------	------

Detectable Results Summary

Client Sample ID: **SWM 12-01**

Lab Sample ID: 1204120011

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	22600	ug/L
Hardness as CaCO3	80.7	mg/L
Magnesium	5880	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	6.49	mg/L
Fecal Coliform	16500	col/100mL

Polynuclear Aromatics GC/MS

Fluoranthene	0.0841	ug/L
Pyrene	0.114	ug/L

Waters Department

Total Suspended Solids	108	mg/L
------------------------	-----	------

Client Sample ID: **SWM 12-01 DUP**

Lab Sample ID: 1204120015

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	23000	ug/L
Hardness as CaCO3	80.5	mg/L
Magnesium	5590	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	6.48	mg/L
Fecal Coliform	17500	col/100mL

Polynuclear Aromatics GC/MS

Fluoranthene	0.0788	ug/L
Pyrene	0.117	ug/L

Waters Department

Total Suspended Solids	117	mg/L
------------------------	-----	------

Client Sample ID: **SWM 03-01**

Lab Sample ID: 1204120017

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.68	ug/L

Client Sample ID: **SWM 04-01**

Lab Sample ID: 1204120018

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.47	ug/L

Client Sample ID: **SWM 05-01**

Lab Sample ID: 1204120019

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	5.98	ug/L

Client Sample ID: **SWM 06-01**

Lab Sample ID: 1204120020

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.41	ug/L

Client Sample ID: **SWM 07-01**

Lab Sample ID: 1204120021

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	5.43	ug/L

Client Sample ID: **SWM 08-01**

Lab Sample ID: 1204120022

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.63	ug/L

Client Sample ID: **SWM 08-01 Dup**

Lab Sample ID: 1204120023

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.60	ug/L

Detectable Results Summary

Client Sample ID: SWM 09-01			
Lab Sample ID: 1204120024	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	2.81	ug/L
Client Sample ID: SWM 10-01			
Lab Sample ID: 1204120025	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	0.963J	ug/L
Client Sample ID: SWM 11-01			
Lab Sample ID: 1204120026	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	3.03	ug/L
Client Sample ID: SWM 12-01			
Lab Sample ID: 1204120027	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	6.06	ug/L
Client Sample ID: SWM 12-01 Dup			
Lab Sample ID: 1204120030	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	6.10	ug/L

Print Date: 09/08/2020 3:55:40PM



Results of **SWM 03-01**

Client Sample ID: **SWM 03-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120001
Lab Project ID: 1204120

Collection Date: 08/11/20 12:05
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	11500	500	150	ug/L	1		09/03/20 18:58
Magnesium	3630	50.0	15.0	ug/L	1		09/03/20 18:58

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 18:58
Container ID: 1204120001-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	43.7	5.00	5.00	mg/L	1		09/03/20 18:58

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 18:58
Container ID: 1204120001-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 03-01**

Client Sample ID: **SWM 03-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120001
Lab Project ID: 1204120

Collection Date: 08/11/20 12:05
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.62	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120001-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2100	100	100	col/100mL	1		08/11/20 16:46

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 16:46
Container ID: 1204120001-A



Results of **SWM 03-01**

Client Sample ID: **SWM 03-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120001
Lab Project ID: 1204120

Collection Date: 08/11/20 12:05
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	17.0	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120001-D



Results of **SWM 04-01**

Client Sample ID: **SWM 04-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120002
Lab Project ID: 1204120

Collection Date: 08/11/20 12:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	18900	500	150	ug/L	1		09/03/20 19:01
Magnesium	5110	50.0	15.0	ug/L	1		09/03/20 19:01

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:01
Container ID: 1204120002-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	68.1	5.00	5.00	mg/L	1		09/03/20 19:01

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:01
Container ID: 1204120002-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 04-01

Client Sample ID: **SWM 04-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120002
 Lab Project ID: 1204120

Collection Date: 08/11/20 12:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 08/12/20 21:22
 Container ID: 1204120002-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	6900	10.0	10.0	col/100mL	1		08/11/20 16:46

Batch Information

Analytical Batch: BTF18319
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 08/11/20 16:46
 Container ID: 1204120002-A



Results of **SWM 04-01**

Client Sample ID: **SWM 04-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120002
Lab Project ID: 1204120

Collection Date: 08/11/20 12:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	8.80	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120002-D



Results of **SWM 05-01**

Client Sample ID: **SWM 05-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120003
Lab Project ID: 1204120

Collection Date: 08/11/20 13:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	10600	500	150	ug/L	1		09/03/20 19:10
Magnesium	2410	50.0	15.0	ug/L	1		09/03/20 19:10

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:10
Container ID: 1204120003-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	36.4	5.00	5.00	mg/L	1		09/03/20 19:10

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:10
Container ID: 1204120003-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 05-01

Client Sample ID: **SWM 05-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120003
 Lab Project ID: 1204120

Collection Date: 08/11/20 13:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.58	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 08/12/20 21:22
 Container ID: 1204120003-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1390	9.09	9.09	col/100mL	1		08/11/20 16:46

Batch Information

Analytical Batch: BTF18319
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 08/11/20 16:46
 Container ID: 1204120003-A



Results of SWM 05-01

Client Sample ID: **SWM 05-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120003
 Lab Project ID: 1204120

Collection Date: 08/11/20 13:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		08/18/20 17:52
Benzo[b]Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Benzo[g,h,i]perylene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Chrysene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		08/18/20 17:52
Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Indeno[1,2,3-c,d] pyrene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		08/18/20 17:52
Phenanthrene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Pyrene	0.0240 U	0.0481	0.0144	ug/L	1		08/18/20 17:52
Surrogates							
2-Methylnaphthalene-d10 (surr)	45	37-78		%	1		08/18/20 17:52
Fluoranthene-d10 (surr)	43.1	24-116		%	1		08/18/20 17:52

Batch Information

Analytical Batch: XMS12199
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 08/18/20 17:52
 Container ID: 1204120003-E

Prep Batch: XXX43644
 Prep Method: SW3520C
 Prep Date/Time: 08/13/20 17:53
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of SWM 05-01

Client Sample ID: **SWM 05-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120003
 Lab Project ID: 1204120

Collection Date: 08/11/20 13:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		08/15/20 19:51
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/15/20 19:51
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/15/20 19:51
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/15/20 19:51
Toluene	0.500 U	1.00	0.310	ug/L	1		08/15/20 19:51

Surrogates

1,2-Dichloroethane-D4 (surr)	99.6	81-118		%	1		08/15/20 19:51
4-Bromofluorobenzene (surr)	101	85-114		%	1		08/15/20 19:51
Toluene-d8 (surr)	97.4	89-112		%	1		08/15/20 19:51

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/15/20 19:51
 Container ID: 1204120003-G

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 08/15/20 15:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 05-01**

Client Sample ID: **SWM 05-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120003
Lab Project ID: 1204120

Collection Date: 08/11/20 13:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	17.8	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120003-D



Results of **SWM 06-01**

Client Sample ID: **SWM 06-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120004
Lab Project ID: 1204120

Collection Date: 08/11/20 11:00
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	8100	500	150	ug/L	1		09/03/20 19:13
Magnesium	2390	50.0	15.0	ug/L	1		09/03/20 19:13

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:13
Container ID: 1204120004-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	30.0	5.00	5.00	mg/L	1		09/03/20 19:13

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:13
Container ID: 1204120004-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 06-01

Client Sample ID: **SWM 06-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120004
 Lab Project ID: 1204120

Collection Date: 08/11/20 11:00
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 08/12/20 21:22
 Container ID: 1204120004-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	640	10.0	10.0	col/100mL	1		08/11/20 16:46

Batch Information

Analytical Batch: BTF18319
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 08/11/20 16:46
 Container ID: 1204120004-A



Results of **SWM 06-01**

Client Sample ID: **SWM 06-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120004
Lab Project ID: 1204120

Collection Date: 08/11/20 11:00
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	7.00	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120004-D



Results of **SWM 07-01**

Client Sample ID: **SWM 07-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120005
Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	4590	500	150	ug/L	1		09/03/20 19:16
Magnesium	1910	50.0	15.0	ug/L	1		09/03/20 19:16

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:16
Container ID: 1204120005-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	19.3	5.00	5.00	mg/L	1		09/03/20 19:16

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:16
Container ID: 1204120005-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 07-01

Client Sample ID: **SWM 07-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120005
 Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	6.01		2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 08/12/20 21:22
 Container ID: 1204120005-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2000		100	100	col/100mL	1		08/11/20 16:46

Batch Information

Analytical Batch: BTF18319
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 08/11/20 16:46
 Container ID: 1204120005-A



Results of SWM 07-01

Client Sample ID: SWM 07-01
Client Project ID: 10227978 MOA StmWtr Outfall M
Lab Sample ID: 1204120005
Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with their respective results and quality indicators.

Batch Information

Analytical Batch: XMS12199
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/18/20 18:12
Container ID: 1204120005-E

Prep Batch: XXX43644
Prep Method: SW3520C
Prep Date/Time: 08/13/20 17:53
Prep Initial Wt./Vol.: 252 mL
Prep Extract Vol: 1 mL

Results of SWM 07-01

Client Sample ID: **SWM 07-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120005
 Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		08/15/20 20:06
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:06
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:06
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/15/20 20:06
Toluene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:06
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		08/15/20 20:06
4-Bromofluorobenzene (surr)	98.6	85-114		%	1		08/15/20 20:06
Toluene-d8 (surr)	97.2	89-112		%	1		08/15/20 20:06

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/15/20 20:06
 Container ID: 1204120005-G

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 08/15/20 15:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 07-01**

Client Sample ID: **SWM 07-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120005
Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	35.0	2.78	0.861	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120005-D



Results of **SWM 08-01**

Client Sample ID: **SWM 08-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120006
Lab Project ID: 1204120

Collection Date: 08/11/20 09:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	7350	500	150	ug/L	1		09/03/20 19:19
Magnesium	1660	50.0	15.0	ug/L	1		09/03/20 19:19

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:19
Container ID: 1204120006-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	25.2	5.00	5.00	mg/L	1		09/03/20 19:19

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:19
Container ID: 1204120006-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 08-01**

Client Sample ID: **SWM 08-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120006
Lab Project ID: 1204120

Collection Date: 08/11/20 09:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.75		2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120006-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1300		100	100	col/100mL	1		08/11/20 16:46

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 16:46
Container ID: 1204120006-A



Results of **SWM 08-01**

Client Sample ID: **SWM 08-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120006
Lab Project ID: 1204120

Collection Date: 08/11/20 09:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	17.2	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120006-D



Results of **SWM 08-01 Dup**

Client Sample ID: **SWM 08-01 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120007
Lab Project ID: 1204120

Collection Date: 08/11/20 09:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	7330	500	150	ug/L	1		09/03/20 19:22
Magnesium	1680	50.0	15.0	ug/L	1		09/03/20 19:22

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:22
Container ID: 1204120007-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	25.2	5.00	5.00	mg/L	1		09/03/20 19:22

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:22
Container ID: 1204120007-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 08-01 Dup**

Client Sample ID: **SWM 08-01 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120007
Lab Project ID: 1204120

Collection Date: 08/11/20 09:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.90	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120007-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2300	100	100	col/100mL	1		08/11/20 17:13

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 17:13
Container ID: 1204120007-A

Results of SWM 08-01 Dup

Client Sample ID: **SWM 08-01 Dup**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120007
 Lab Project ID: 1204120

Collection Date: 08/11/20 09:40
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	16.6	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 08/17/20 17:10
 Container ID: 1204120007-D



Results of **SWM 09-01**

Client Sample ID: **SWM 09-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120008
Lab Project ID: 1204120

Collection Date: 08/11/20 10:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	13500	500	150	ug/L	1		09/03/20 19:25
Magnesium	2850	50.0	15.0	ug/L	1		09/03/20 19:25

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:25
Container ID: 1204120008-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	45.6	5.00	5.00	mg/L	1		09/03/20 19:25

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:25
Container ID: 1204120008-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 09-01**

Client Sample ID: **SWM 09-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120008
Lab Project ID: 1204120

Collection Date: 08/11/20 10:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.40	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120008-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2400	100	100	col/100mL	1		08/11/20 17:13

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 17:13
Container ID: 1204120008-A



Results of SWM 09-01

Client Sample ID: SWM 09-01
Client Project ID: 10227978 MOA StmWtr Outfall M
Lab Sample ID: 1204120008
Lab Project ID: 1204120

Collection Date: 08/11/20 10:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated quality and detection data.

Batch Information

Analytical Batch: XMS12199
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/18/20 18:33
Container ID: 1204120008-E

Prep Batch: XXX43644
Prep Method: SW3520C
Prep Date/Time: 08/13/20 17:53
Prep Initial Wt./Vol.: 234 mL
Prep Extract Vol: 1 mL

Results of SWM 09-01

Client Sample ID: **SWM 09-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120008
 Lab Project ID: 1204120

Collection Date: 08/11/20 10:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		08/15/20 20:21
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:21
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:21
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/15/20 20:21
Toluene	0.329 J	1.00	0.310	ug/L	1		08/15/20 20:21
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		08/15/20 20:21
4-Bromofluorobenzene (surr)	97.9	85-114		%	1		08/15/20 20:21
Toluene-d8 (surr)	96	89-112		%	1		08/15/20 20:21

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/15/20 20:21
 Container ID: 1204120008-G

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 08/15/20 15:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 09-01**

Client Sample ID: **SWM 09-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120008
Lab Project ID: 1204120

Collection Date: 08/11/20 10:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	10.2	2.00	0.620	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120008-D



Results of **SWM 10-01**

Client Sample ID: **SWM 10-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120009
Lab Project ID: 1204120

Collection Date: 08/11/20 10:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	30600	500	150	ug/L	1		09/03/20 19:28
Magnesium	7410	50.0	15.0	ug/L	1		09/03/20 19:28

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:28
Container ID: 1204120009-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	107	5.00	5.00	mg/L	1		09/03/20 19:28

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:28
Container ID: 1204120009-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 10-01**

Client Sample ID: **SWM 10-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120009
Lab Project ID: 1204120

Collection Date: 08/11/20 10:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120009-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	30	1.64	1.64	col/100mL	1		08/11/20 17:13

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 17:13
Container ID: 1204120009-A



Results of **SWM 10-01**

Client Sample ID: **SWM 10-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120009
Lab Project ID: 1204120

Collection Date: 08/11/20 10:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	2.80	1.00	0.310	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120009-D



Results of **SWM 11-01**

Client Sample ID: **SWM 11-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120010
Lab Project ID: 1204120

Collection Date: 08/11/20 11:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	4440	500	150	ug/L	1		09/03/20 19:31
Magnesium	1450	50.0	15.0	ug/L	1		09/03/20 19:31

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:31
Container ID: 1204120010-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	17.0	5.00	5.00	mg/L	1		09/03/20 19:31

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:31
Container ID: 1204120010-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 11-01

Client Sample ID: **SWM 11-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120010
 Lab Project ID: 1204120

Collection Date: 08/11/20 11:30
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.10		2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 08/12/20 21:22
 Container ID: 1204120010-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	4400		100	100	col/100mL	1		08/11/20 17:13

Batch Information

Analytical Batch: BTF18319
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 08/11/20 17:13
 Container ID: 1204120010-A



Results of **SWM 11-01**

Client Sample ID: **SWM 11-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120010
Lab Project ID: 1204120

Collection Date: 08/11/20 11:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	72.0	4.00	1.24	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120010-D



Results of **SWM 12-01**

Client Sample ID: **SWM 12-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120011
Lab Project ID: 1204120

Collection Date: 08/11/20 12:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	22600	500	150	ug/L	1		09/06/20 16:32
Magnesium	5880	50.0	15.0	ug/L	1		09/06/20 16:32

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 16:32
Container ID: 1204120011-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	80.7	5.00	5.00	mg/L	1		09/06/20 16:32

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 16:32
Container ID: 1204120011-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 12-01**

Client Sample ID: **SWM 12-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120011
Lab Project ID: 1204120

Collection Date: 08/11/20 12:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	6.49	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120011-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	16500	100	100	col/100mL	1		08/11/20 17:13

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 17:13
Container ID: 1204120011-A



Results of SWM 12-01

Client Sample ID: SWM 12-01
Client Project ID: 10227978 MOA StmWtr Outfall M
Lab Sample ID: 1204120011
Lab Project ID: 1204120

Collection Date: 08/11/20 12:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various aromatic compounds like Acenaphthene, Anthracene, etc., with their respective results and limits.

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists surrogate compounds like 2-Methylnaphthalene-d10 and Fluoranthene-d10.

Batch Information

Analytical Batch: XMS12199
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/18/20 18:53
Container ID: 1204120011-E

Prep Batch: XXX43644
Prep Method: SW3520C
Prep Date/Time: 08/13/20 17:53
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of SWM 12-01

Client Sample ID: **SWM 12-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120011
 Lab Project ID: 1204120

Collection Date: 08/11/20 12:40
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		08/15/20 20:37
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:37
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:37
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/15/20 20:37
Toluene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:37

Surrogates

1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		08/15/20 20:37
4-Bromofluorobenzene (surr)	99.5	85-114		%	1		08/15/20 20:37
Toluene-d8 (surr)	96.3	89-112		%	1		08/15/20 20:37

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/15/20 20:37
 Container ID: 1204120011-G

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 08/15/20 15:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 12-01**

Client Sample ID: **SWM 12-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120011
Lab Project ID: 1204120

Collection Date: 08/11/20 12:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	108	7.69	2.38	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120011-D



Results of **SWM 12-01 DUP**

Client Sample ID: **SWM 12-01 DUP**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120015
Lab Project ID: 1204120

Collection Date: 08/11/20 12:42
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	23000	500	150	ug/L	1		09/03/20 19:34
Magnesium	5590	50.0	15.0	ug/L	1		09/03/20 19:34

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:34
Container ID: 1204120015-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	80.5	5.00	5.00	mg/L	1		09/03/20 19:34

Batch Information

Analytical Batch: MMS10869
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/03/20 19:34
Container ID: 1204120015-B

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 12-01 DUP**

Client Sample ID: **SWM 12-01 DUP**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120015
Lab Project ID: 1204120

Collection Date: 08/11/20 12:42
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	6.48	2.00	2.00	mg/L	1		08/12/20 21:22

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/12/20 21:22
Container ID: 1204120015-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	17500	100	100	col/100mL	1		08/11/20 18:33

Batch Information

Analytical Batch: BTF18321
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/11/20 18:33
Container ID: 1204120015-A



Results of SWM 12-01 DUP

Client Sample ID: SWM 12-01 DUP
Client Project ID: 10227978 MOA StmWtr Outfall M
Lab Sample ID: 1204120015
Lab Project ID: 1204120

Collection Date: 08/11/20 12:42
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various aromatic compounds like Acenaphthene, Anthracene, etc., with their respective results and limits.

Batch Information

Analytical Batch: XMS12199
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/18/20 19:55
Container ID: 1204120015-E

Prep Batch: XXX43644
Prep Method: SW3520C
Prep Date/Time: 08/13/20 17:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of SWM 12-01 DUP

Client Sample ID: **SWM 12-01 DUP**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120015
 Lab Project ID: 1204120

Collection Date: 08/11/20 12:42
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		08/15/20 20:52
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:52
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:52
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/15/20 20:52
Toluene	0.500 U	1.00	0.310	ug/L	1		08/15/20 20:52
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		08/15/20 20:52
4-Bromofluorobenzene (surr)	98.3	85-114		%	1		08/15/20 20:52
Toluene-d8 (surr)	96.8	89-112		%	1		08/15/20 20:52

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/15/20 20:52
 Container ID: 1204120015-G

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 08/15/20 15:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 12-01 DUP

Client Sample ID: **SWM 12-01 DUP**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120015
Lab Project ID: 1204120

Collection Date: 08/11/20 12:42
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	117	6.67	2.07	mg/L	1		08/17/20 17:10

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/17/20 17:10
Container ID: 1204120015-D

Results of SWM-TMpB-01

Client Sample ID: **SWM-TMpB-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120016
 Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location: Trip Blanks

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		08/15/20 18:50
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/15/20 18:50
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/15/20 18:50
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/15/20 18:50
Toluene	0.500 U	1.00	0.310	ug/L	1		08/15/20 18:50
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		08/15/20 18:50
4-Bromofluorobenzene (surr)	99.7	85-114		%	1		08/15/20 18:50
Toluene-d8 (surr)	96.9	89-112		%	1		08/15/20 18:50

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/15/20 18:50
 Container ID: 1204120016-A

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 08/15/20 15:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 03-01**

Client Sample ID: **SWM 03-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120017
Lab Project ID: 1204120

Collection Date: 08/11/20 12:05
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.68	1.00	0.310	ug/L	1		09/03/20 19:37

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:37
Container ID: 1204120017-A

Prep Batch: MX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 04-01

Client Sample ID: **SWM 04-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120018
 Lab Project ID: 1204120

Collection Date: 08/11/20 12:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	3.47	1.00	0.310	ug/L	1		09/03/20 19:46

Batch Information

Analytical Batch: MMS10869
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 09/03/20 19:46
 Container ID: 1204120018-A

Prep Batch: MX33558
 Prep Method: E200.2
 Prep Date/Time: 08/22/20 17:29
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM 05-01**

Client Sample ID: **SWM 05-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120019
Lab Project ID: 1204120

Collection Date: 08/11/20 13:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	5.98	1.00	0.310	ug/L	1		09/03/20 19:49

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:49
Container ID: 1204120019-A

Prep Batch: MX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 06-01**

Client Sample ID: **SWM 06-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120020
Lab Project ID: 1204120

Collection Date: 08/11/20 11:00
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	2.41	1.00	0.310	ug/L	1		09/03/20 19:52

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:52
Container ID: 1204120020-A

Prep Batch: MXX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 07-01**

Client Sample ID: **SWM 07-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120021
Lab Project ID: 1204120

Collection Date: 08/11/20 09:10
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	5.43	1.00	0.310	ug/L	1		09/03/20 19:55

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 19:55
Container ID: 1204120021-A

Prep Batch: MX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 08-01

Client Sample ID: **SWM 08-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120022
 Lab Project ID: 1204120

Collection Date: 08/11/20 09:30
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	2.63	1.00	0.310	ug/L	1		09/03/20 19:58

Batch Information

Analytical Batch: MMS10869
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 09/03/20 19:58
 Container ID: 1204120022-A

Prep Batch: MX33558
 Prep Method: E200.2
 Prep Date/Time: 08/22/20 17:29
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM 08-01 Dup**

Client Sample ID: **SWM 08-01 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120023
Lab Project ID: 1204120

Collection Date: 08/11/20 09:40
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.60	1.00	0.310	ug/L	1		09/03/20 20:01

Batch Information

Analytical Batch: MMS10869
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/03/20 20:01
Container ID: 1204120023-A

Prep Batch: MX33558
Prep Method: E200.2
Prep Date/Time: 08/22/20 17:29
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 09-01

Client Sample ID: **SWM 09-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120024
 Lab Project ID: 1204120

Collection Date: 08/11/20 10:10
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	2.81		1.00	0.310	ug/L	1		09/03/20 18:52

Batch Information

Analytical Batch: MMS10869
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 09/03/20 18:52
 Container ID: 1204120024-A

Prep Batch: MX33558
 Prep Method: E200.2
 Prep Date/Time: 08/22/20 17:29
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 10-01

Client Sample ID: **SWM 10-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120025
 Lab Project ID: 1204120

Collection Date: 08/11/20 10:30
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	0.963 J	1.00	0.310	ug/L	1		08/27/20 14:54

Batch Information

Analytical Batch: MMS10864
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 08/27/20 14:54
 Container ID: 1204120025-A

Prep Batch: MX33579
 Prep Method: E200.2
 Prep Date/Time: 08/26/20 16:02
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM 11-01**

Client Sample ID: **SWM 11-01**
Client Project ID: **10227978 MOA StmWtr Outfall M**
Lab Sample ID: 1204120026
Lab Project ID: 1204120

Collection Date: 08/11/20 11:30
Received Date: 08/11/20 14:15
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.03	1.00	0.310	ug/L	1		08/27/20 15:00

Batch Information

Analytical Batch: MMS10864
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 08/27/20 15:00
Container ID: 1204120026-A

Prep Batch: MX33579
Prep Method: E200.2
Prep Date/Time: 08/26/20 16:02
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 12-01

Client Sample ID: **SWM 12-01**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120027
 Lab Project ID: 1204120

Collection Date: 08/11/20 12:40
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	6.06	1.00	0.310	ug/L	1		08/27/20 14:45

Batch Information

Analytical Batch: MMS10864
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 08/27/20 14:45
 Container ID: 1204120027-A

Prep Batch: MX33579
 Prep Method: E200.2
 Prep Date/Time: 08/26/20 16:02
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 12-01 Dup

Client Sample ID: **SWM 12-01 Dup**
 Client Project ID: **10227978 MOA StmWtr Outfall M**
 Lab Sample ID: 1204120030
 Lab Project ID: 1204120

Collection Date: 08/11/20 12:42
 Received Date: 08/11/20 14:15
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	6.10	1.00	0.310	ug/L	1		08/27/20 15:25

Batch Information

Analytical Batch: MMS10864
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 08/27/20 15:25
 Container ID: 1204120030-A

Prep Batch: MXX33579
 Prep Method: E200.2
 Prep Date/Time: 08/26/20 16:02
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Method Blank

Blank ID: MB for HBN 1810212 [BOD/6686]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1574344

QC for Samples:

1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011, 1204120015

Results by SM21 5210B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Biochemical Oxygen Demand	2.00U	2.00	2.00	mg/L

Batch Information

Analytical Batch: BOD6686

Analytical Method: SM21 5210B

Instrument:

Analyst: A.L

Analytical Date/Time: 8/12/2020 9:22:02PM

Print Date: 09/08/2020 3:55:46PM

Duplicate Sample Summary

Original Sample ID: 1204120011
Duplicate Sample ID: 1204120014
QC for Samples:

Analysis Date: 08/12/2020 21:22
Matrix: Water (Surface, Eff., Ground)

Results by SM21 5210B

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Biochemical Oxygen Demand	6.49	6.96	mg/L	7.00	

Batch Information

Analytical Batch: BOD6686
Analytical Method: SM21 5210B
Instrument:
Analyst: A.L

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204120 [BOD6686]

Blank Spike Lab ID: 1574345

Date Analyzed: 08/12/2020 21:22

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011, 1204120015

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	196	99	(84.6-115.4

Batch Information

Analytical Batch: **BOD6686**

Analytical Method: **SM21 5210B**

Instrument:

Analyst: **A.L**



Method Blank

Blank ID: MB for HBN 1810150 [BTF/18319]
Blank Lab ID: 1574090

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011

Results by SM21 9222D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18319
Analytical Method: SM21 9222D
Instrument:
Analyst: A.L
Analytical Date/Time: 8/11/2020 4:46:48PM

Print Date: 09/08/2020 3:55:52PM



Method Blank

Blank ID: MB for HBN 1810152 [BTF/18321]
Blank Lab ID: 1574093

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204120015

Results by SM21 9222D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18321
Analytical Method: SM21 9222D
Instrument:
Analyst: A.L
Analytical Date/Time: 8/11/2020 6:33:17PM

Print Date: 09/08/2020 3:55:57PM

Method Blank

Blank ID: MB for HBN 1810682 [MXX/33558]
 Blank Lab ID: 1576384

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009,
 1204120010, 1204120011, 1204120015, 1204120017, 1204120018, 1204120019, 1204120020, 1204120021, 1204120022,
 1204120023, 1204120024

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Calcium	250U	500	150	ug/L
Copper	0.500U	1.00	0.310	ug/L
Magnesium	25.0U	50.0	15.0	ug/L

Batch Information

Analytical Batch: MMS10869
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/3/2020 6:37:43PM

Prep Batch: MXX33558
 Prep Method: E200.2
 Prep Date/Time: 8/22/2020 5:29:02PM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204120 [MXX33558]

Blank Spike Lab ID: 1576385

Date Analyzed: 09/03/2020 18:40

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011, 1204120015, 1204120017, 1204120018, 1204120019, 1204120020, 1204120021, 1204120022, 1204120023, 1204120024

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	11000	110	(85-115)
Copper	1000	1100	110	(85-115)
Magnesium	10000	11200	112	(85-115)

Batch Information

Analytical Batch: **MMS10869**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **DMM**

Prep Batch: **MXX33558**

Prep Method: **E200.2**

Prep Date/Time: **08/22/2020 17:29**

Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1204120024
 MS Sample ID: 1576388 MS
 MSD Sample ID:

Analysis Date: 09/03/2020 18:52
 Analysis Date: 09/03/2020 18:55
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120015, 1204120017, 1204120018, 1204120019, 1204120020, 1204120021, 1204120022, 1204120023, 1204120024

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	2.81	1000	1040	104				70-130		

Batch Information

Analytical Batch: MMS10869
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/3/2020 6:55:38PM

Prep Batch: MXX33558
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/22/2020 5:29:02PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Billable Matrix Spike Summary

Original Sample ID: 1204120011
 MS Sample ID: 1204120012 BMS
 MSD Sample ID: 1204120013 BMSD

Analysis Date: 09/06/2020 16:32
 Analysis Date: 09/06/2020 16:35
 Analysis Date: 09/06/2020 16:38
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Calcium	22600	10000	35400	128	10000	35400	128	70-130	0.05	(< 20)
Magnesium	5880	10000	18000	122	10000	17400	115	70-130	3.50	(< 20)

Batch Information

Analytical Batch: MMS10871
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/6/2020 4:35:11PM

Prep Batch: MXX33558
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/22/2020 5:29:02PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/08/2020 3:56:06PM

Method Blank

Blank ID: MB for HBN 1810920 [MXX/33579]
Blank Lab ID: 1577551

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204120025, 1204120026, 1204120027, 1204120030

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Copper	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: MMS10864
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 8/27/2020 2:36:32PM

Prep Batch: MXX33579
Prep Method: E200.2
Prep Date/Time: 8/26/2020 4:02:06PM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204120 [MXX33579]

Blank Spike Lab ID: 1577552

Date Analyzed: 08/27/2020 14:39

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120025, 1204120026, 1204120027, 1204120030

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL (85-115)
	Spike	Result	Rec (%)	
Copper	1000	1070	107	

Batch Information

Analytical Batch: **MMS10864**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **DMM**

Prep Batch: **MXX33579**

Prep Method: **E200.2**

Prep Date/Time: **08/26/2020 16:02**

Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1577554
 MS Sample ID: 1577555 MS
 MSD Sample ID:

Analysis Date: 08/27/2020 14:45
 Analysis Date: 08/27/2020 14:48
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120025, 1204120026, 1204120027, 1204120030

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	6.06	1000	1090	108				70-130		

Batch Information

Analytical Batch: MMS10864
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 8/27/2020 2:48:29PM

Prep Batch: MXX33579
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/26/2020 4:02:06PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Billable Matrix Spike Summary

Original Sample ID: 1204120027
 MS Sample ID: 1204120028 BMS
 MSD Sample ID: 1204120029 BMSD

Analysis Date: 08/27/2020 14:45
 Analysis Date: 08/27/2020 14:48
 Analysis Date: 08/27/2020 14:51
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	6.06	1000	1090	108	1000	1080	107	70-130	0.87	(< 20)

Batch Information

Analytical Batch: MMS10864
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 8/27/2020 2:48:29PM

Prep Batch: MXX33579
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/26/2020 4:02:06PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1810398 [STS/6772]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1575146

QC for Samples:

1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011, 1204120015

Results by SM21 2540D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Suspended Solids	0.500U	1.00	0.310	mg/L

Batch Information

Analytical Batch: STS6772

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Analytical Date/Time: 8/17/2020 5:10:20PM

Duplicate Sample Summary

Original Sample ID: 1204120011

Duplicate Sample ID: 1575149

QC for Samples:

1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011, 1204120015

Analysis Date: 08/17/2020 17:10

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	108	123	mg/L	13.30*	(< 5)

Batch Information

Analytical Batch: STS6772

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Duplicate Sample Summary

Original Sample ID: 1204237001

Duplicate Sample ID: 1575150

QC for Samples:

1204120015

Analysis Date: 08/17/2020 17:10

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	51.0	60.0	mg/L	16.20*	(< 5)

Batch Information

Analytical Batch: STS6772

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/08/2020 3:56:18PM

Duplicate Sample Summary

Original Sample ID: 1204120011
Duplicate Sample ID: 1204120014
QC for Samples:

Analysis Date: 08/17/2020 17:10
Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	108	123	mg/L	13.30*	(< 5)

Batch Information

Analytical Batch: STS6772
Analytical Method: SM21 2540D
Instrument:
Analyst: S.S

Print Date: 09/08/2020 3:56:18PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204120 [STS6772]
 Blank Spike Lab ID: 1575147
 Date Analyzed: 08/17/2020 17:10

Spike Duplicate ID: LCSD for HBN 1204120 [STS6772]
 Spike Duplicate Lab ID: 1575148
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120001, 1204120002, 1204120003, 1204120004, 1204120005, 1204120006, 1204120007, 1204120008, 1204120009, 1204120010, 1204120011, 1204120015

Results by SM21 2540D

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Total Suspended Solids	25	24.9	100	25	25.1	100	(75-125)	0.80	(< 5)

Batch Information

Analytical Batch: **STS6772**
 Analytical Method: **SM21 2540D**
 Instrument:
 Analyst: **S.S**

Method Blank

Blank ID: MB for HBN 1810373 [VXX/36133]
 Blank Lab ID: 1575026

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1204120003, 1204120005, 1204120008, 1204120011, 1204120015, 1204120016

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	81-118		%
4-Bromofluorobenzene (surr)	101	85-114		%
Toluene-d8 (surr)	95.8	89-112		%

Batch Information

Analytical Batch: VMS20205
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: NRB
 Analytical Date/Time: 8/15/2020 3:01:00PM

Prep Batch: VXX36133
 Prep Method: SW5030B
 Prep Date/Time: 8/15/2020 3:00:00PM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204120 [VXX36133]
 Blank Spike Lab ID: 1575027
 Date Analyzed: 08/15/2020 15:16

Spike Duplicate ID: LCSD for HBN 1204120 [VXX36133]
 Spike Duplicate Lab ID: 1575028
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120003, 1204120005, 1204120008, 1204120011, 1204120015, 1204120016

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	30.8	103	30	30.0	100	(79-120)	2.70	(< 20)
Ethylbenzene	30	29.9	100	30	28.6	96	(79-121)	4.10	(< 20)
o-Xylene	30	29.8	100	30	29.5	98	(78-122)	1.10	(< 20)
P & M -Xylene	60	59.9	100	60	57.9	97	(80-121)	3.40	(< 20)
Toluene	30	28.3	94	30	27.7	92	(80-121)	2.20	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	106	106	30	109	109	(81-118)	2.40	
4-Bromofluorobenzene (surr)	30	98.1	98	30	97.1	97	(85-114)	1.00	
Toluene-d8 (surr)	30	95.4	95	30	95.9	96	(89-112)	0.54	

Batch Information

Analytical Batch: **VMS20205**
 Analytical Method: **EPA 602/624**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **NRB**

Prep Batch: **VXX36133**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/15/2020 15:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL



Billable Matrix Spike Summary

Original Sample ID: 1204120011
MS Sample ID: 1204120012 BMS
MSD Sample ID: 1204120013 BMSD

Analysis Date: 08/15/2020 20:37
Analysis Date: 08/15/2020 17:18
Analysis Date: 08/15/2020 17:34
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	31.3	104	30.0	31.0	103	79-120	0.70	(< 20)
Ethylbenzene	0.500U	30.0	31.1	104	30.0	30.0	100	79-121	3.60	(< 20)
o-Xylene	0.500U	30.0	30.2	101	30.0	29.9	100	78-122	0.83	(< 20)
P & M -Xylene	1.00U	60.0	61.2	102	60.0	60.2	100	80-121	1.70	(< 20)
Toluene	0.500U	30.0	29.4	98	30.0	28.9	96	80-121	1.60	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	28.9	96	30.0	30.5	102	81-118	5.40	
4-Bromofluorobenzene (surr)		30.0	30.2	101	30.0	29.7	99	85-114	1.70	
Toluene-d8 (surr)		30.0	29.3	98	30.0	29.1	97	89-112	0.48	

Batch Information

Analytical Batch: VMS20205
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 8/15/2020 5:18:00PM

Prep Batch: VXX36133
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 8/15/2020 3:00:00PM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 09/08/2020 3:56:27PM



Method Blank

Blank ID: MB for HBN 1810273 [XXX/43644]
Blank Lab ID: 1574555

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204120003, 1204120005, 1204120008, 1204120011, 1204120015

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	64	37-78		%
Fluoranthene-d10 (surr)	65.1	24-116		%

Batch Information

Analytical Batch: XMS12199
Analytical Method: EPA 625M SIM (PAH) LV
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 8/18/2020 11:20:00AM

Prep Batch: XXX43644
Prep Method: SW3520C
Prep Date/Time: 8/13/2020 5:53:10PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204120 [XXX43644]
 Blank Spike Lab ID: 1574556
 Date Analyzed: 08/18/2020 11:41

Spike Duplicate ID: LCSD for HBN 1204120
 [XXX43644]
 Spike Duplicate Lab ID: 1574557
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204120003, 1204120005, 1204120008, 1204120011, 1204120015

Results by EPA 625M SIM (PAH) LV

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	2	1.47	74	2	1.37	69	(48-114)	6.90	(< 20)
Acenaphthylene	2	1.50	75	2	1.40	70	(35-121)	7.30	(< 20)
Anthracene	2	1.71	86	2	1.61	81	(53-119)	6.10	(< 20)
Benzo(a)Anthracene	2	1.34	67	2	1.25	63	(59-120)	6.60	(< 20)
Benzo[a]pyrene	2	1.59	79	2	1.49	74	(53-120)	6.40	(< 20)
Benzo[b]Fluoranthene	2	1.63	81	2	1.55	77	(53-126)	5.00	(< 20)
Benzo[g,h,i]perylene	2	1.50	75	2	1.38	69	(44-128)	7.90	(< 20)
Benzo[k]fluoranthene	2	1.54	77	2	1.44	72	(54-125)	6.50	(< 20)
Chrysene	2	1.53	76	2	1.47	73	(57-120)	4.10	(< 20)
Dibenzo[a,h]anthracene	2	1.38	69	2	1.27	64	(44-131)	8.10	(< 20)
Fluoranthene	2	1.48	74	2	1.38	69	(58-120)	6.90	(< 20)
Fluorene	2	1.50	75	2	1.42	71	(50-118)	5.60	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.63	81	2	1.52	76	(48-130)	6.70	(< 20)
Naphthalene	2	1.38	69	2	1.27	63	(43-114)	8.40	(< 20)
Phenanthrene	2	1.58	79	2	1.54	77	(53-115)	2.40	(< 20)
Pyrene	2	1.46	73	2	1.38	69	(53-121)	5.50	(< 20)

Surrogates

2-Methylnaphthalene-d10 (surr)	2	63.8	64	2	60.4	60	(37-78)	5.60	
Fluoranthene-d10 (surr)	2	64.7	65	2	62.4	62	(24-116)	3.60	

Batch Information

Analytical Batch: XMS12199
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: DSD

Prep Batch: XXX43644
 Prep Method: SW3520C
 Prep Date/Time: 08/13/2020 17:53
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Billable Matrix Spike Summary

Original Sample ID: 1204120011
 MS Sample ID: 1204120012 BMS
 MSD Sample ID: 1204120013 BMSD

Analysis Date: 08/18/2020 18:53
 Analysis Date: 08/18/2020 19:14
 Analysis Date: 08/18/2020 19:34
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0245U	1.92	1.1	57	1.92	0.838	44 *	48-114	27.00	* (< 20)
Acenaphthylene	0.0245U	1.92	1.19	62	1.92	0.895	47	35-121	28.70	* (< 20)
Anthracene	0.0245U	1.92	1.06	55	1.92	0.793	41 *	53-119	28.60	* (< 20)
Benzo(a)Anthracene	0.0245U	1.92	.588	31 *	1.92	0.400	21 *	59-120	38.10	* (< 20)
Benzo[a]pyrene	0.00980U	1.92	.43	22 *	1.92	0.270	14 *	53-120	45.80	* (< 20)
Benzo[b]Fluoranthene	0.0245U	1.92	.504	26 *	1.92	0.316	16 *	53-126	45.90	* (< 20)
Benzo[g,h,i]perylene	0.0245U	1.92	.327	17 *	1.92	0.211	11 *	44-128	43.00	* (< 20)
Benzo[k]fluoranthene	0.0245U	1.92	.436	23 *	1.92	0.282	15 *	54-125	43.00	* (< 20)
Chrysene	0.0245U	1.92	.733	38 *	1.92	0.504	26 *	57-120	37.00	* (< 20)
Dibenzo[a,h]anthracene	0.00980U	1.92	.306	16 *	1.92	0.189	10 *	44-131	47.00	* (< 20)
Fluoranthene	0.0841	1.92	1.04	50 *	1.92	0.773	36 *	58-120	29.30	* (< 20)
Fluorene	0.0245U	1.92	1.1	57	1.92	0.842	44 *	50-118	27.00	* (< 20)
Indeno[1,2,3-c,d] pyrene	0.0245U	1.92	.32	17 *	1.92	0.192	10 *	48-130	49.70	* (< 20)
Naphthalene	0.0490U	1.92	1.08	56	1.92	0.835	43	43-114	25.80	* (< 20)
Phenanthrene	0.0245U	1.92	1.11	58	1.92	0.835	43 *	53-115	28.40	* (< 20)
Pyrene	0.114	1.92	1.06	49 *	1.92	0.780	35 *	53-121	30.20	* (< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	1.05	54	1.92	0.798	42	37-78	26.90	
Fluoranthene-d10 (surr)		1.92	.906	47	1.92	0.674	35	24-116	29.40	

Batch Information

Analytical Batch: XMS12199
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: DSD
 Analytical Date/Time: 8/18/2020 7:14:00PM

Prep Batch: XXX43644
 Prep Method: 3520 Liq/Liq Ext for 8270 PAH SIM LV
 Prep Date/Time: 8/13/2020 5:53:10PM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL



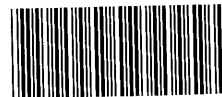
CLIENT: HDR Inc.					Instruction: _____ must be filled out. Omissions may delay the onset of analysis.										Page 1 of 2									
CONTACT: Cindy Helmericks					PHONE #: 907-644-2017					Section 3					Preservative									
PROJECT NAME: MOA Stormwater Outfall Monitoring					PROJECT/PWSID/PERMIT#: 10227978					#					CONTAINER									
REPORTS TO: Cindy Helmericks					E-MAIL: cindy.helmericks@hdrinc.com					Comp					Grab									
INVOICE TO: HDR Inc.					QUOTE #: _____					MI (Multi-incremental)					Analysis*									
RESERVED for lab use					SAMPLE IDENTIFICATION					DATE mm/dd/yy					TIME HH:MM					MATRIX/MATRIX CODE				
10B					SWM 03-01					08/11/20					12:05					WS 5				
2AD					SWM 04-01										12:10					WS 5				
3AJ					SWM 05-01										13:10					WS 10				
4AD					SWM 06-01										11:00					WS 5				
5AJ					SWM 07-01										9:10					WS 10				
6AD					SWM 08-01										9:30					WS 5				
7AD					SWM 08-01 Dup										9:40					WS 5				
8AJ					SWM 09-01										10:10					WS 10				
9AD					SWM 10-01										10:30					WS 5				
10AD					SWM 11-01										11:30					WS 5				
11AF-13AF					SWM 12-01 (14AC)										12:40					WS 27				
15AT					SWM 12-01 Dup										12:42					WS 10				
Relinquished By: (1)					Date					Time					Received By:					Section 4				
Kacy Helmericks					8/11/20					14:20										DOD Project? Yes (No)				
Relinquished By: (2)					Date					Time					Received By:					Cooler ID:				
Relinquished By: (3)					Date					Time					Received By:					Requested Turnaround Time and/or Special Instructions:				
Relinquished By: (4)					Date					Time					Received For Laboratory By:					Temp Blank °C: 15.7 D44				
					8/11/20					4:15					RJC					23.8 D5				
																				Chain of Custody Seal: (Circle)				
																				INTACT BROKEN (ABSENT)				
																				Delivery Method: Hand Delivery [X] Commercial Delivery []				

12:45
11/8/11



SGS North America Inc. CHAIN OF CUSTODY RECORD

1204120



www.us.sgs.com

CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>2</u> of <u>2</u>						
CONTACT: Cindy Helmericks					PHONE #: 907-644-2017					Section 3		Preservative									
PROJECT NAME: MOA Stormwater Outfall Monitoring					PROJECT/PWSID/PERMIT#: 10227978					# CONTAINERS	Analysis*										NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS
REPORTS TO: Cindy Helmericks					E-MAIL: cindy.helmericks@hdrinc.com																
INVOICE TO: HDR Inc.					QUOTE #: P.O. #:																
Section 2	RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)	REMARKS/LOC ID						
	(16AC)	SWM-TmpB-01	8/11/20	9:10	US			3	G									Trip Blanks (2)			
Section 5	Relinquished By: (1)		Date	Time	Received By:		Section 4		DOD Project? Yes <input type="radio"/> No <input checked="" type="radio"/>		Data Deliverable Requirements:										
	<i>Henry Shelton</i>		8/11/20	14:20			Cooler ID:		Requested Turnaround Time and/or Special Instructions:												
	Relinquished By: (2)		Date	Time			Received By:														
	Relinquished By: (3)		Date	Time			Received By:														
Relinquished By: (4)		Date	Time	Received For Laboratory By:			Temp Blank °C: <u>15.7 D44</u> <u>23.8 DS1</u> or Ambient []		Chain of Custody Seal: (Circle) INTACT BROKEN <u>ABSENT</u>												
		8/11/20	14:20	<i>Henry Shelton</i> RJC		Delivery Method: Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery []															

http://www.sgs.com/terms-and-conditions

3) 6.8 D52
4) 10.8 D52
5) 3.4 D44



e-Sample Receipt Form

SGS Workorder #:

1204120



1 2 0 4 1 2 0

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
Yes **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 5.7 °C Therm. ID: D44
	Yes	Cooler ID: 2 @ 3.8 °C Therm. ID: D51
	No	Cooler ID: 3 @ 6.8 °C Therm. ID: D52
	No	Cooler ID: 4 @ 10.8 °C Therm. ID: D52
	Yes	Cooler ID: 5 @ 3.4 °C Therm. ID: D44
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		
*If >6°C, were samples collected <8 hours ago?	Yes	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g, 200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204120001-A	Na2S2O3 for Chlorine Redu	OK	1204120009-D	No Preservative Required	OK
1204120001-B	HNO3 to pH < 2	OK	1204120010-A	Na2S2O3 for Chlorine Redu	OK
1204120001-C	No Preservative Required	OK	1204120010-B	HNO3 to pH < 2	OK
1204120001-D	No Preservative Required	OK	1204120010-C	No Preservative Required	OK
1204120002-A	Na2S2O3 for Chlorine Redu	OK	1204120010-D	No Preservative Required	OK
1204120002-B	HNO3 to pH < 2	OK	1204120011-A	Na2S2O3 for Chlorine Redu	OK
1204120002-C	No Preservative Required	OK	1204120011-B	HNO3 to pH < 2	OK
1204120002-D	No Preservative Required	OK	1204120011-C	No Preservative Required	OK
1204120003-A	Na2S2O3 for Chlorine Redu	OK	1204120011-D	No Preservative Required	OK
1204120003-B	HNO3 to pH < 2	OK	1204120011-E	No Preservative Required	OK
1204120003-C	No Preservative Required	OK	1204120011-F	No Preservative Required	OK
1204120003-D	No Preservative Required	OK	1204120011-G	HCL to pH < 2	OK
1204120003-E	No Preservative Required	OK	1204120011-H	HCL to pH < 2	OK
1204120003-F	No Preservative Required	OK	1204120011-I	HCL to pH < 2	OK
1204120003-G	HCL to pH < 2	OK	1204120012-A	HNO3 to pH < 2	OK
1204120003-H	HCL to pH < 2	OK	1204120012-B	No Preservative Required	OK
1204120003-I	HCL to pH < 2	OK	1204120012-C	No Preservative Required	OK
1204120004-A	Na2S2O3 for Chlorine Redu	OK	1204120012-D	HCL to pH < 2	OK
1204120004-B	HNO3 to pH < 2	OK	1204120012-E	HCL to pH < 2	OK
1204120004-C	No Preservative Required	OK	1204120012-F	HCL to pH < 2	OK
1204120004-D	No Preservative Required	OK	1204120013-A	HNO3 to pH < 2	OK
1204120005-A	Na2S2O3 for Chlorine Redu	OK	1204120013-B	No Preservative Required	OK
1204120005-B	HNO3 to pH < 2	OK	1204120013-C	No Preservative Required	OK
1204120005-C	No Preservative Required	OK	1204120013-D	HCL to pH < 2	OK
1204120005-D	No Preservative Required	OK	1204120013-E	HCL to pH < 2	OK
1204120005-E	No Preservative Required	OK	1204120013-F	HCL to pH < 2	OK
1204120005-F	No Preservative Required	OK	1204120014-A	Na2S2O3 for Chlorine Redu	OK
1204120005-G	HCL to pH < 2	OK	1204120014-B	No Preservative Required	OK
1204120005-H	HCL to pH < 2	OK	1204120014-C	No Preservative Required	OK
1204120005-I	HCL to pH < 2	OK	1204120015-A	Na2S2O3 for Chlorine Redu	OK
1204120006-A	Na2S2O3 for Chlorine Redu	OK	1204120015-B	HNO3 to pH < 2	OK
1204120006-B	HNO3 to pH < 2	OK	1204120015-C	No Preservative Required	OK
1204120006-C	No Preservative Required	OK	1204120015-D	No Preservative Required	OK
1204120006-D	No Preservative Required	OK	1204120015-E	No Preservative Required	OK
1204120007-A	Na2S2O3 for Chlorine Redu	OK	1204120015-F	No Preservative Required	OK
1204120007-B	HNO3 to pH < 2	OK	1204120015-G	HCL to pH < 2	OK
1204120007-C	No Preservative Required	OK	1204120015-H	HCL to pH < 2	OK
1204120007-D	No Preservative Required	OK	1204120015-I	HCL to pH < 2	OK
1204120008-A	Na2S2O3 for Chlorine Redu	OK	1204120016-A	HCL to pH < 2	OK
1204120008-B	HNO3 to pH < 2	OK	1204120016-B	HCL to pH < 2	OK
1204120008-C	No Preservative Required	OK	1204120016-C	HCL to pH < 2	OK
1204120008-D	No Preservative Required	OK	1204120017-A	No Preservative Required	OK
1204120008-E	No Preservative Required	OK	1204120017-B	HNO3 to pH < 2	OK
1204120008-F	No Preservative Required	OK	1204120018-A	No Preservative Required	OK
1204120008-G	HCL to pH < 2	OK	1204120018-B	HNO3 to pH < 2	OK
1204120008-H	HCL to pH < 2	OK	1204120019-A	No Preservative Required	OK
1204120008-I	HCL to pH < 2	OK	1204120019-B	HNO3 to pH < 2	OK
1204120009-A	Na2S2O3 for Chlorine Redu	OK	1204120020-A	No Preservative Required	OK
1204120009-B	HNO3 to pH < 2	OK	1204120020-B	HNO3 to pH < 2	OK
1204120009-C	No Preservative Required	OK	1204120021-A	No Preservative Required	OK

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204120021-B	HNO3 to pH < 2	OK			
1204120022-A	No Preservative Required	OK			
1204120022-B	HNO3 to pH < 2	OK			
1204120023-A	No Preservative Required	OK			
1204120023-B	HNO3 to pH < 2	OK			
1204120024-A	No Preservative Required	OK			
1204120024-B	HNO3 to pH < 2	OK			
1204120025-A	No Preservative Required	OK			
1204120025-B	HNO3 to pH < 2	OK			
1204120026-A	No Preservative Required	OK			
1204120026-B	HNO3 to pH < 2	OK			
1204120027-A	No Preservative Required	OK			
1204120027-B	HNO3 to pH < 2	OK			
1204120028-A	No Preservative Required	OK			
1204120028-B	HNO3 to pH < 2	OK			
1204120029-A	No Preservative Required	OK			
1204120029-B	HNO3 to pH < 2	OK			
1204120030-A	No Preservative Required	OK			
1204120030-B	HNO3 to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

Appendix C2
Laboratory Data Package
Storm Event #2

Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
2525 C Street, #500
Anchorage, AK 99503
(907)644-2017

Report Number: **1204455**

Client Project: **10227978 MOA SWOF Monitoring**

Dear Cynthia Helmericks,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**

SGS Project: **1204455**

Project Name/Site: **10227978 MOA SWOF Monitoring**

Project Contact: **Cynthia Helmericks**

Refer to sample receipt form for information on sample condition.

SWM 12-02 Lab Dup (1204455015) BDUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Refer to LCS/LCSD RPD for batch precision.

1204384001DUP (1577245) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. The difference between sample and duplicate results is less than the LOQ.

1204455011DUP (1577789) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Refer to LCS/LCSD RPD for batch precision.

MB for HBN 1810791 [BOD/6696] (1576964) MB

5210B – BOD - MB (0.22 mg/L) is greater than the recommended limit of 0.2 mg/L. Samples >10X the MB are not significantly affected. Samples <10X the MB results may be biased high.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 09/15/2020 8:38:35AM

Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
EPA 625M SIM (PAH) LV				
1204455014	SWM 12-02 MSD	XMS12240	Benzo[b]Fluoranthene	RP
1577852	1204455012MSD	XMS12240	Benzo[b]Fluoranthene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.



Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
SWM 03-02	1204455001	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 04-02	1204455002	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 05-02	1204455003	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 06-02	1204455004	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 07-02	1204455005	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 08-02	1204455006	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 08-02 Dup	1204455007	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 09-02	1204455008	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 10-02	1204455009	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 11-02	1204455010	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02	1204455011	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 Dup	1204455012	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 MS	1204455013	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 MSD	1204455014	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 Lab Dup	1204455015	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM TripBlank-02	1204455016	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 03-02	1204455017	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 04-02	1204455018	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 05-02	1204455019	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 06-02	1204455020	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 07-02	1204455021	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 08-02	1204455022	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 08-02 Dup	1204455023	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 09-02	1204455024	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 10-02	1204455025	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 11-02	1204455026	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02	1204455027	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 Dup	1204455028	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 MS	1204455029	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)
SWM 12-02 MSD	1204455030	08/24/2020	08/24/2020	Water (Surface, Eff., Ground)

Print Date: 09/15/2020 8:38:39AM

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
<u>Method</u>	<u>Method Description</u>			
EPA 602/624	602 Aromatics by 624 (W)			
EPA 625M SIM (PAH) LV	625 PAH SIM GC/MS Low Volume			
SM21 5210B	Biochemical Oxygen Demand SM21 5210B			
SM21 9222D	Fecal Coliform (MF)			
SM21 2340B	Hardness as CaCO3 by ICP-MS			
EP200.8	Metals in Drinking Water by ICP-MS DISSO			
EP200.8	Metals in Water by 200.8 ICP-MS			
SM21 2540D	Total Suspended Solids SM20 2540D			

Print Date: 09/15/2020 8:38:39AM

Detectable Results Summary

Client Sample ID: **SWM 03-02**

Lab Sample ID: 1204455001

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	11300	ug/L
Hardness as CaCO3	47.1	mg/L
Magnesium	4580	ug/L
Fecal Coliform	664	col/100mL
Total Suspended Solids	11.8	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 04-02**

Lab Sample ID: 1204455002

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	23100	ug/L
Hardness as CaCO3	86.0	mg/L
Magnesium	6880	ug/L
Fecal Coliform	9730	col/100mL
Total Suspended Solids	16.6	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 05-02**

Lab Sample ID: 1204455003

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	15900	ug/L
Hardness as CaCO3	53.0	mg/L
Magnesium	3220	ug/L
Fecal Coliform	2100	col/100mL
Total Suspended Solids	6.00	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 06-02**

Lab Sample ID: 1204455004

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	8170	ug/L
Hardness as CaCO3	30.4	mg/L
Magnesium	2420	ug/L
Biochemical Oxygen Demand	2.11	mg/L
Fecal Coliform	1800	col/100mL
Total Suspended Solids	8.00	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 07-02**

Lab Sample ID: 1204455005

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	4020	ug/L
Hardness as CaCO3	17.6	mg/L
Magnesium	1820	ug/L
Biochemical Oxygen Demand	3.62	mg/L
Fecal Coliform	1100	col/100mL
Fluoranthene	0.0490	ug/L
Phenanthrene	0.0411J	ug/L
Pyrene	0.0647	ug/L
Total Suspended Solids	57.5	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Detectable Results Summary

Client Sample ID: **SWM 08-02**

Lab Sample ID: 1204455006

Metals by ICP/MS

Parameter	Result	Units
Calcium	3790	ug/L
Hardness as CaCO ₃	13.1	mg/L
Magnesium	895	ug/L
Biochemical Oxygen Demand	2.65	mg/L
Fecal Coliform	10100	col/100mL
Total Suspended Solids	34.0	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 08-02 Dup**

Lab Sample ID: 1204455007

Metals by ICP/MS

Parameter	Result	Units
Calcium	4370	ug/L
Hardness as CaCO ₃	15.1	mg/L
Magnesium	1010	ug/L
Biochemical Oxygen Demand	2.66	mg/L
Fecal Coliform	8300	col/100mL
Total Suspended Solids	30.8	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 09-02**

Lab Sample ID: 1204455008

Metals by ICP/MS

Parameter	Result	Units
Calcium	7710	ug/L
Hardness as CaCO ₃	27.2	mg/L
Magnesium	1920	ug/L
Biochemical Oxygen Demand	3.30	mg/L
Fecal Coliform	2800	col/100mL
Benzo(a)Anthracene	0.0479J	ug/L
Benzo[a]pyrene	0.0537	ug/L
Benzo[b]Fluoranthene	0.161	ug/L
Benzo[g,h,i]perylene	0.0873	ug/L
Chrysene	0.155	ug/L
Fluoranthene	0.199	ug/L
Indeno[1,2,3-c,d] pyrene	0.0695	ug/L
Phenanthrene	0.0628	ug/L
Pyrene	0.142	ug/L
Toluene	0.580J	ug/L
Total Suspended Solids	32.9	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Volatile GC/MS

Waters Department

Client Sample ID: **SWM 10-02**

Lab Sample ID: 1204455009

Metals by ICP/MS

Parameter	Result	Units
Calcium	28800	ug/L
Hardness as CaCO ₃	102	mg/L
Magnesium	7320	ug/L
Fecal Coliform	148	col/100mL
Total Suspended Solids	4.20	mg/L

Microbiology Laboratory

Waters Department

Detectable Results Summary

Client Sample ID: **SWM 11-02**

Lab Sample ID: 1204455010

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	14700	ug/L
Hardness as CaCO3	45.4	mg/L
Magnesium	2110	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	2.87	mg/L
Fecal Coliform	5200	col/100mL
Total Suspended Solids	6.00	mg/L

Waters Department

Client Sample ID: **SWM 12-02**

Lab Sample ID: 1204455011

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	17900	ug/L
Hardness as CaCO3	61.9	mg/L
Magnesium	4200	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	3.18	mg/L
Fecal Coliform	4100	col/100mL
Total Suspended Solids	20.0	mg/L

Waters Department

Client Sample ID: **SWM 12-02 Dup**

Lab Sample ID: 1204455012

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	17500	ug/L
Hardness as CaCO3	60.8	mg/L
Magnesium	4170	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	3.18	mg/L
Fecal Coliform	3800	col/100mL
Total Suspended Solids	17.8	mg/L

Waters Department

Client Sample ID: **SWM 03-02**

Lab Sample ID: 1204455017

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	1.77	ug/L

Client Sample ID: **SWM 04-02**

Lab Sample ID: 1204455018

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.35	ug/L

Client Sample ID: **SWM 05-02**

Lab Sample ID: 1204455019

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.96	ug/L

Client Sample ID: **SWM 06-02**

Lab Sample ID: 1204455020

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.29	ug/L

Client Sample ID: **SWM 07-02**

Lab Sample ID: 1204455021

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.40	ug/L

Client Sample ID: **SWM 08-02**

Lab Sample ID: 1204455022

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.01	ug/L

Detectable Results Summary

Client Sample ID: **SWM 08-02 Dup**

Lab Sample ID: 1204455023

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	1.76	ug/L

Client Sample ID: **SWM 09-02**

Lab Sample ID: 1204455024

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.55	ug/L

Client Sample ID: **SWM 10-02**

Lab Sample ID: 1204455025

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	0.788J	ug/L

Client Sample ID: **SWM 11-02**

Lab Sample ID: 1204455026

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.58	ug/L

Client Sample ID: **SWM 12-02**

Lab Sample ID: 1204455027

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.79	ug/L

Client Sample ID: **SWM 12-02 Dup**

Lab Sample ID: 1204455028

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	5.28	ug/L



Results of **SWM 03-02**

Client Sample ID: **SWM 03-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455001
Lab Project ID: 1204455

Collection Date: 08/24/20 11:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	11300	500	150	ug/L	1		09/06/20 23:07
Magnesium	4580	50.0	15.0	ug/L	1		09/06/20 23:07

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:07
Container ID: 1204455001-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	47.1	5.00	5.00	mg/L	1		09/06/20 23:07

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:07
Container ID: 1204455001-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 03-02**

Client Sample ID: **SWM 03-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455001
Lab Project ID: 1204455

Collection Date: 08/24/20 11:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455001-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	664	9.09	9.09	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455001-D



Results of **SWM 03-02**

Client Sample ID: **SWM 03-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455001
Lab Project ID: 1204455

Collection Date: 08/24/20 11:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	11.8	2.00	0.620	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455001-C



Results of **SWM 04-02**

Client Sample ID: **SWM 04-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455002
Lab Project ID: 1204455

Collection Date: 08/24/20 11:50
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	23100	500	150	ug/L	1		09/06/20 23:28
Magnesium	6880	50.0	15.0	ug/L	1		09/06/20 23:28

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:28
Container ID: 1204455002-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	86.0	5.00	5.00	mg/L	1		09/06/20 23:28

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:28
Container ID: 1204455002-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 04-02**

Client Sample ID: **SWM 04-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455002
Lab Project ID: 1204455

Collection Date: 08/24/20 11:50
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455002-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	9730	90.9	90.9	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455002-D



Results of SWM 04-02

Client Sample ID: **SWM 04-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455002
Lab Project ID: 1204455

Collection Date: 08/24/20 11:50
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	16.6	2.00	0.620	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455002-C



Results of **SWM 05-02**

Client Sample ID: **SWM 05-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455003
Lab Project ID: 1204455

Collection Date: 08/24/20 13:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	15900	500	150	ug/L	1		09/06/20 23:31
Magnesium	3220	50.0	15.0	ug/L	1		09/06/20 23:31

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:31
Container ID: 1204455003-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	53.0	5.00	5.00	mg/L	1		09/06/20 23:31

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:31
Container ID: 1204455003-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 05-02**

Client Sample ID: **SWM 05-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455003
Lab Project ID: 1204455

Collection Date: 08/24/20 13:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455003-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2100	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455003-D



Results of SWM 05-02

Client Sample ID: **SWM 05-02**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455003
 Lab Project ID: 1204455

Collection Date: 08/24/20 13:05
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Acenaphthylene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Benzo(a)Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Benzo[a]pyrene	0.0102 U	0.0204	0.00633	ug/L	1		08/31/20 17:20
Benzo[b]Fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Benzo[g,h,i]perylene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Benzo[k]fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Chrysene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Dibenzo[a,h]anthracene	0.0102 U	0.0204	0.00633	ug/L	1		08/31/20 17:20
Fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Fluorene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Indeno[1,2,3-c,d] pyrene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Naphthalene	0.0510 U	0.102	0.0316	ug/L	1		08/31/20 17:20
Phenanthrene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Pyrene	0.0255 U	0.0510	0.0153	ug/L	1		08/31/20 17:20
Surrogates							
2-Methylnaphthalene-d10 (surr)	57.6	37-78		%	1		08/31/20 17:20
Fluoranthene-d10 (surr)	71.4	24-116		%	1		08/31/20 17:20

Batch Information

Analytical Batch: XMS12240
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 08/31/20 17:20
 Container ID: 1204455003-E

Prep Batch: XXX43753
 Prep Method: SW3535A
 Prep Date/Time: 08/28/20 12:10
 Prep Initial Wt./Vol.: 245 mL
 Prep Extract Vol: 1 mL

Results of SWM 05-02

Client Sample ID: **SWM 05-02**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455003
 Lab Project ID: 1204455

Collection Date: 08/24/20 13:05
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/25/20 19:09
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:09
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:09
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/25/20 19:09
Toluene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:09
Surrogates							
1,2-Dichloroethane-D4 (surr)	100	81-118		%	1		08/25/20 19:09
4-Bromofluorobenzene (surr)	105	85-114		%	1		08/25/20 19:09
Toluene-d8 (surr)	103	89-112		%	1		08/25/20 19:09

Batch Information

Analytical Batch: VMS20246
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/25/20 19:09
 Container ID: 1204455003-G

Prep Batch: VXX36213
 Prep Method: SW5030B
 Prep Date/Time: 08/25/20 12:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 05-02

Client Sample ID: **SWM 05-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455003
Lab Project ID: 1204455

Collection Date: 08/24/20 13:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	6.00	2.00	0.620	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455003-C



Results of **SWM 06-02**

Client Sample ID: **SWM 06-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455004
Lab Project ID: 1204455

Collection Date: 08/24/20 10:40
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	8170	500	150	ug/L	1		09/06/20 23:34
Magnesium	2420	50.0	15.0	ug/L	1		09/06/20 23:34

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:34
Container ID: 1204455004-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	30.4	5.00	5.00	mg/L	1		09/06/20 23:34

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:34
Container ID: 1204455004-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 06-02**

Client Sample ID: **SWM 06-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455004
Lab Project ID: 1204455

Collection Date: 08/24/20 10:40
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.11	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455004-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1800	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455004-D



Results of SWM 06-02

Client Sample ID: **SWM 06-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455004
Lab Project ID: 1204455

Collection Date: 08/24/20 10:40
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	8.00	2.00	0.620	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455004-C



Results of **SWM 07-02**

Client Sample ID: **SWM 07-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455005
Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	4020	500	150	ug/L	1		09/06/20 23:37
Magnesium	1820	50.0	15.0	ug/L	1		09/06/20 23:37

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:37
Container ID: 1204455005-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	17.6	5.00	5.00	mg/L	1		09/06/20 23:37

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:37
Container ID: 1204455005-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 07-02**

Client Sample ID: **SWM 07-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455005
Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.62	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455005-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1100	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455005-D



Results of SWM 07-02

Client Sample ID: **SWM 07-02**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455005
 Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Acenaphthylene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Benzo(a)Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Benzo[a]pyrene	0.00925 U	0.0185	0.00574	ug/L	1		08/31/20 17:40
Benzo[b]Fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Benzo[g,h,i]perylene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Benzo[k]fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Chrysene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Dibenzo[a,h]anthracene	0.00925 U	0.0185	0.00574	ug/L	1		08/31/20 17:40
Fluoranthene	0.0490	0.0463	0.0139	ug/L	1		08/31/20 17:40
Fluorene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Indeno[1,2,3-c,d] pyrene	0.0232 U	0.0463	0.0139	ug/L	1		08/31/20 17:40
Naphthalene	0.0463 U	0.0926	0.0287	ug/L	1		08/31/20 17:40
Phenanthrene	0.0411 J	0.0463	0.0139	ug/L	1		08/31/20 17:40
Pyrene	0.0647	0.0463	0.0139	ug/L	1		08/31/20 17:40
Surrogates							
2-Methylnaphthalene-d10 (surr)	55.5	37-78		%	1		08/31/20 17:40
Fluoranthene-d10 (surr)	73.6	24-116		%	1		08/31/20 17:40

Batch Information

Analytical Batch: XMS12240
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 08/31/20 17:40
 Container ID: 1204455005-E

Prep Batch: XXX43753
 Prep Method: SW3535A
 Prep Date/Time: 08/28/20 12:10
 Prep Initial Wt./Vol.: 270 mL
 Prep Extract Vol: 1 mL

Results of SWM 07-02

Client Sample ID: **SWM 07-02**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455005
 Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/25/20 19:24
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:24
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:24
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/25/20 19:24
Toluene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:24
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	81-118		%	1		08/25/20 19:24
4-Bromofluorobenzene (surr)	107	85-114		%	1		08/25/20 19:24
Toluene-d8 (surr)	104	89-112		%	1		08/25/20 19:24

Batch Information

Analytical Batch: VMS20246
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/25/20 19:24
 Container ID: 1204455005-G

Prep Batch: VXX36213
 Prep Method: SW5030B
 Prep Date/Time: 08/25/20 12:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 07-02

Client Sample ID: **SWM 07-02**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455005
 Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	57.5	5.00	1.55	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 08/26/20 15:40
 Container ID: 1204455005-C



Results of **SWM 08-02**

Client Sample ID: **SWM 08-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455006
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	3790	500	150	ug/L	1		09/06/20 23:40
Magnesium	895	50.0	15.0	ug/L	1		09/06/20 23:40

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:40
Container ID: 1204455006-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	13.1	5.00	5.00	mg/L	1		09/06/20 23:40

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:40
Container ID: 1204455006-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 08-02**

Client Sample ID: **SWM 08-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455006
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.65	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455006-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	10100	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455006-D



Results of SWM 08-02

Client Sample ID: **SWM 08-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455006
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	34.0	2.50	0.775	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455006-C



Results of SWM 08-02 Dup

Client Sample ID: **SWM 08-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455007
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	4370	500	150	ug/L	1		09/06/20 23:43
Magnesium	1010	50.0	15.0	ug/L	1		09/06/20 23:43

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:43
Container ID: 1204455007-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	15.1	5.00	5.00	mg/L	1		09/06/20 23:43

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:43
Container ID: 1204455007-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 08-02 Dup

Client Sample ID: **SWM 08-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455007
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.66	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455007-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	8300	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455007-D



Results of SWM 08-02 Dup

Client Sample ID: **SWM 08-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455007
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	30.8	2.50	0.775	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455007-C



Results of **SWM 09-02**

Client Sample ID: **SWM 09-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455008
Lab Project ID: 1204455

Collection Date: 08/24/20 09:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	7710	500	150	ug/L	1		09/06/20 23:46
Magnesium	1920	50.0	15.0	ug/L	1		09/06/20 23:46

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:46
Container ID: 1204455008-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	27.2	5.00	5.00	mg/L	1		09/06/20 23:46

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:46
Container ID: 1204455008-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 09-02**

Client Sample ID: **SWM 09-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455008
Lab Project ID: 1204455

Collection Date: 08/24/20 09:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.30	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455008-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2800	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455008-D



Results of SWM 09-02

Client Sample ID: SWM 09-02
Client Project ID: 10227978 MOA SWOF Monitoring
Lab Sample ID: 1204455008
Lab Project ID: 1204455

Collection Date: 08/24/20 09:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate values.

Batch Information

Analytical Batch: XMS12240
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/31/20 18:01
Container ID: 1204455008-E

Prep Batch: XXX43753
Prep Method: SW3535A
Prep Date/Time: 08/28/20 12:10
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL



Results of **SWM 09-02**

Client Sample ID: **SWM 09-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455008
Lab Project ID: 1204455

Collection Date: 08/24/20 09:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/25/20 19:38
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:38
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:38
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/25/20 19:38
Toluene	0.580 J	1.00	0.310	ug/L	1		08/25/20 19:38
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/25/20 19:38
4-Bromofluorobenzene (surr)	107	85-114		%	1		08/25/20 19:38
Toluene-d8 (surr)	103	89-112		%	1		08/25/20 19:38

Batch Information

Analytical Batch: VMS20246
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/25/20 19:38
Container ID: 1204455008-G

Prep Batch: VXX36213
Prep Method: SW5030B
Prep Date/Time: 08/25/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of SWM 09-02

Client Sample ID: **SWM 09-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455008
Lab Project ID: 1204455

Collection Date: 08/24/20 09:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	32.9	2.86	0.886	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455008-C



Results of **SWM 10-02**

Client Sample ID: **SWM 10-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455009
Lab Project ID: 1204455

Collection Date: 08/24/20 10:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	28800	500	150	ug/L	1		09/06/20 23:55
Magnesium	7320	50.0	15.0	ug/L	1		09/06/20 23:55

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:55
Container ID: 1204455009-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	102	5.00	5.00	mg/L	1		09/06/20 23:55

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:55
Container ID: 1204455009-B

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 10-02**

Client Sample ID: **SWM 10-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455009
Lab Project ID: 1204455

Collection Date: 08/24/20 10:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455009-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	148	1.00	1.00	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455009-D



Results of SWM 10-02

Client Sample ID: **SWM 10-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455009
Lab Project ID: 1204455

Collection Date: 08/24/20 10:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	4.20	1.00	0.310	mg/L	1		08/26/20 15:40

Batch Information

Analytical Batch: STS6776
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/26/20 15:40
Container ID: 1204455009-C



Results of **SWM 11-02**

Client Sample ID: **SWM 11-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455010
Lab Project ID: 1204455

Collection Date: 08/24/20 11:10
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	14700	500	150	ug/L	1		09/06/20 23:58
Magnesium	2110	50.0	15.0	ug/L	1		09/06/20 23:58

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/06/20 23:58
Container ID: 1204455010-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	45.4	5.00	5.00	mg/L	1		09/06/20 23:58

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/06/20 23:58
Container ID: 1204455010-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 11-02**

Client Sample ID: **SWM 11-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455010
Lab Project ID: 1204455

Collection Date: 08/24/20 11:10
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.87	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455010-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	5200	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455010-D



Results of SWM 11-02

Client Sample ID: **SWM 11-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455010
Lab Project ID: 1204455

Collection Date: 08/24/20 11:10
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	6.00	1.33	0.413	mg/L	1		08/28/20 15:14

Batch Information

Analytical Batch: STS6777
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/28/20 15:14
Container ID: 1204455010-C



Results of **SWM 12-02**

Client Sample ID: **SWM 12-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455011
Lab Project ID: 1204455

Collection Date: 08/24/20 12:20
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	17900	500	150	ug/L	1		09/07/20 00:01
Magnesium	4200	50.0	15.0	ug/L	1		09/07/20 00:01

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:01
Container ID: 1204455011-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	61.9	5.00	5.00	mg/L	1		09/07/20 00:01

Batch Information

Analytical Batch: MMS10871
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/07/20 00:01
Container ID: 1204455011-B

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 12-02

Client Sample ID: **SWM 12-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455011
Lab Project ID: 1204455

Collection Date: 08/24/20 12:20
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.18	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455011-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	4100	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455011-D



Results of SWM 12-02

Client Sample ID: SWM 12-02
Client Project ID: 10227978 MOA SWOF Monitoring
Lab Sample ID: 1204455011
Lab Project ID: 1204455

Collection Date: 08/24/20 12:20
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated quality and detection data.

Batch Information

Analytical Batch: XMS12240
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/31/20 18:21
Container ID: 1204455011-E

Prep Batch: XXX43753
Prep Method: SW3535A
Prep Date/Time: 08/28/20 12:10
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of SWM 12-02

Client Sample ID: **SWM 12-02**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455011
 Lab Project ID: 1204455

Collection Date: 08/24/20 12:20
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/25/20 19:53
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:53
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:53
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/25/20 19:53
Toluene	0.500 U	1.00	0.310	ug/L	1		08/25/20 19:53
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/25/20 19:53
4-Bromofluorobenzene (surr)	107	85-114		%	1		08/25/20 19:53
Toluene-d8 (surr)	103	89-112		%	1		08/25/20 19:53

Batch Information

Analytical Batch: VMS20246
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/25/20 19:53
 Container ID: 1204455011-G

Prep Batch: VXX36213
 Prep Method: SW5030B
 Prep Date/Time: 08/25/20 12:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 12-02**

Client Sample ID: **SWM 12-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455011
Lab Project ID: 1204455

Collection Date: 08/24/20 12:20
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Waters Department**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	20.0	2.50	0.775	mg/L	1		08/28/20 15:14

Batch Information

Analytical Batch: STS6777
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/28/20 15:14
Container ID: 1204455011-C



Results of SWM 12-02 Dup

Client Sample ID: **SWM 12-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455012
Lab Project ID: 1204455

Collection Date: 08/24/20 12:25
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	17500	500	150	ug/L	1		09/06/20 23:19
Magnesium	4170	50.0	15.0	ug/L	1		09/06/20 23:19

Batch Information

Analytical Batch: MMS10871	Prep Batch: MX33591
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: DMM	Prep Date/Time: 09/02/20 13:45
Analytical Date/Time: 09/06/20 23:19	Prep Initial Wt./Vol.: 20 mL
Container ID: 1204455012-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	60.8	5.00	5.00	mg/L	1		09/06/20 23:19

Batch Information

Analytical Batch: MMS10871	Prep Batch: MX33591
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: DMM	Prep Date/Time: 09/02/20 13:45
Analytical Date/Time: 09/06/20 23:19	Prep Initial Wt./Vol.: 20 mL
Container ID: 1204455012-B	Prep Extract Vol: 50 mL



Results of **SWM 12-02 Dup**

Client Sample ID: **SWM 12-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455012
Lab Project ID: 1204455

Collection Date: 08/24/20 12:25
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.18	2.00	2.00	mg/L	1		08/25/20 14:20

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 08/25/20 14:20
Container ID: 1204455012-A

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	3800	100	100	col/100mL	1		08/24/20 16:37

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Analyst: A.L
Analytical Date/Time: 08/24/20 16:37
Container ID: 1204455012-D



Results of SWM 12-02 Dup

Client Sample ID: SWM 12-02 Dup
Client Project ID: 10227978 MOA SWOF Monitoring
Lab Sample ID: 1204455012
Lab Project ID: 1204455

Collection Date: 08/24/20 12:25
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated quality and detection data.

Batch Information

Analytical Batch: XMS12240
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 08/31/20 18:42
Container ID: 1204455012-E

Prep Batch: XXX43753
Prep Method: SW3535A
Prep Date/Time: 08/28/20 12:10
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of SWM 12-02 Dup

Client Sample ID: **SWM 12-02 Dup**
 Client Project ID: **10227978 MOA SWOF Monitoring**
 Lab Sample ID: 1204455012
 Lab Project ID: 1204455

Collection Date: 08/24/20 12:25
 Received Date: 08/24/20 13:55
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/25/20 16:43
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/25/20 16:43
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/25/20 16:43
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/25/20 16:43
Toluene	0.500 U	1.00	0.310	ug/L	1		08/25/20 16:43
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/25/20 16:43
4-Bromofluorobenzene (surr)	107	85-114		%	1		08/25/20 16:43
Toluene-d8 (surr)	104	89-112		%	1		08/25/20 16:43

Batch Information

Analytical Batch: VMS20246
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/25/20 16:43
 Container ID: 1204455012-G

Prep Batch: VXX36213
 Prep Method: SW5030B
 Prep Date/Time: 08/25/20 12:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 12-02 Dup

Client Sample ID: **SWM 12-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455012
Lab Project ID: 1204455

Collection Date: 08/24/20 12:25
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	17.8	2.00	0.620	mg/L	1		08/28/20 15:14

Batch Information

Analytical Batch: STS6777
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 08/28/20 15:14
Container ID: 1204455012-C



Results of SWM TripBlank-02

Client Sample ID: **SWM TripBlank-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455016
Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: Trip Blanks (3)

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/25/20 16:13
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/25/20 16:13
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/25/20 16:13
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/25/20 16:13
Toluene	0.500 U	1.00	0.310	ug/L	1		08/25/20 16:13
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		08/25/20 16:13
4-Bromofluorobenzene (surr)	107	85-114		%	1		08/25/20 16:13
Toluene-d8 (surr)	103	89-112		%	1		08/25/20 16:13

Batch Information

Analytical Batch: VMS20246
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/25/20 16:13
Container ID: 1204455016-A

Prep Batch: VXX36213
Prep Method: SW5030B
Prep Date/Time: 08/25/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of SWM 03-02

Client Sample ID: **SWM 03-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455017
Lab Project ID: 1204455

Collection Date: 08/24/20 11:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.77	1.00	0.310	ug/L	1		09/07/20 00:04

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:04
Container ID: 1204455017-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 04-02**

Client Sample ID: **SWM 04-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455018
Lab Project ID: 1204455

Collection Date: 08/24/20 11:50
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.35	1.00	0.310	ug/L	1		09/07/20 00:07

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:07
Container ID: 1204455018-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 05-02**

Client Sample ID: **SWM 05-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455019
Lab Project ID: 1204455

Collection Date: 08/24/20 13:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.96	1.00	0.310	ug/L	1		09/07/20 00:10

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:10
Container ID: 1204455019-A

Prep Batch: MX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 06-02

Client Sample ID: **SWM 06-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455020
Lab Project ID: 1204455

Collection Date: 08/24/20 10:40
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.29	1.00	0.310	ug/L	1		09/07/20 00:13

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:13
Container ID: 1204455020-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 07-02**

Client Sample ID: **SWM 07-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455021
Lab Project ID: 1204455

Collection Date: 08/24/20 09:00
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	4.40	1.00	0.310	ug/L	1		09/07/20 00:16

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:16
Container ID: 1204455021-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 08-02**

Client Sample ID: **SWM 08-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455022
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.01	1.00	0.310	ug/L	1		09/07/20 00:19

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:19
Container ID: 1204455022-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 08-02 Dup

Client Sample ID: **SWM 08-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455023
Lab Project ID: 1204455

Collection Date: 08/24/20 09:15
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.76	1.00	0.310	ug/L	1		09/07/20 00:22

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:22
Container ID: 1204455023-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 09-02**

Client Sample ID: **SWM 09-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455024
Lab Project ID: 1204455

Collection Date: 08/24/20 09:45
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.55	1.00	0.310	ug/L	1		09/07/20 00:34

Batch Information

Analytical Batch: MMS10871
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/07/20 00:34
Container ID: 1204455024-A

Prep Batch: MXX33591
Prep Method: E200.2
Prep Date/Time: 09/02/20 13:45
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 10-02

Client Sample ID: **SWM 10-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455025
Lab Project ID: 1204455

Collection Date: 08/24/20 10:05
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	0.788 J	1.00	0.310	ug/L	1		09/13/20 12:14

Batch Information

Analytical Batch: MMS10877
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/13/20 12:14
Container ID: 1204455025-A

Prep Batch: MXX33592
Prep Method: E200.2
Prep Date/Time: 09/02/20 16:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 11-02**

Client Sample ID: **SWM 11-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455026
Lab Project ID: 1204455

Collection Date: 08/24/20 11:10
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.58	1.00	0.310	ug/L	1		09/13/20 12:38

Batch Information

Analytical Batch: MMS10877
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/13/20 12:38
Container ID: 1204455026-A

Prep Batch: MXX33592
Prep Method: E200.2
Prep Date/Time: 09/02/20 16:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 12-02

Client Sample ID: **SWM 12-02**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455027
Lab Project ID: 1204455

Collection Date: 08/24/20 12:20
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	4.79	1.00	0.310	ug/L	1		09/13/20 12:41

Batch Information

Analytical Batch: MMS10877
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/13/20 12:41
Container ID: 1204455027-A

Prep Batch: MX33592
Prep Method: E200.2
Prep Date/Time: 09/02/20 16:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 12-02 Dup

Client Sample ID: **SWM 12-02 Dup**
Client Project ID: **10227978 MOA SWOF Monitoring**
Lab Sample ID: 1204455028
Lab Project ID: 1204455

Collection Date: 08/24/20 12:25
Received Date: 08/24/20 13:55
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	5.28	1.00	0.310	ug/L	1		09/13/20 12:29

Batch Information

Analytical Batch: MMS10877
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/13/20 12:29
Container ID: 1204455028-A

Prep Batch: MX33592
Prep Method: E200.2
Prep Date/Time: 09/02/20 16:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Method Blank

Blank ID: MB for HBN 1810791 [BOD/6696]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1576964

QC for Samples:

1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009, 1204455010, 1204455011, 1204455012

Results by SM21 5210B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Biochemical Oxygen Demand	2.00U	2.00	2.00	mg/L

Batch Information

Analytical Batch: BOD6696

Analytical Method: SM21 5210B

Instrument:

Analyst: A.L

Analytical Date/Time: 8/25/2020 2:20:24PM

Print Date: 09/15/2020 8:38:46AM

Duplicate Sample Summary

Original Sample ID: 1204455011
Duplicate Sample ID: 1204455015
QC for Samples:

Analysis Date: 08/25/2020 14:20
Matrix: Water (Surface, Eff., Ground)

Results by SM21 5210B

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Biochemical Oxygen Demand	3.18	2.98	mg/L	6.50	

Batch Information

Analytical Batch: BOD6696
Analytical Method: SM21 5210B
Instrument:
Analyst: A.L

Print Date: 09/15/2020 8:38:48AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [BOD6696]

Blank Spike Lab ID: 1576965

Date Analyzed: 08/25/2020 14:20

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009, 1204455010, 1204455011, 1204455012

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	207	105	(84.6-115.4

Batch Information

Analytical Batch: **BOD6696**

Analytical Method: **SM21 5210B**

Instrument:

Analyst: **A.L**

Print Date: 09/15/2020 8:38:49AM



Method Blank

Blank ID: MB for HBN 1810771 [BTF/18342]
Blank Lab ID: 1576864

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009, 1204455010, 1204455011, 1204455012

Results by SM21 9222D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Instrument:
Analyst: A.L
Analytical Date/Time: 8/24/2020 4:37:19PM

Print Date: 09/15/2020 8:38:52AM

Duplicate Sample Summary

Original Sample ID: 1204455011
Duplicate Sample ID: 1204455015
QC for Samples:

Analysis Date: 08/24/2020 16:37
Matrix: Water (Surface, Eff., Ground)

Results by SM21 9222D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Fecal Coliform	4100	3800	col/100mL	7.59	

Batch Information

Analytical Batch: BTF18342
Analytical Method: SM21 9222D
Instrument:
Analyst: A.L

Print Date: 09/15/2020 8:38:53AM

Method Blank

Blank ID: MB for HBN 1811193 [MXX/33591]
 Blank Lab ID: 1578745

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009,
 1204455010, 1204455011, 1204455012, 1204455017, 1204455018, 1204455019, 1204455020, 1204455021, 1204455022,
 1204455023, 1204455024

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Calcium	250U	500	150	ug/L
Copper	0.500U	1.00	0.310	ug/L
Magnesium	25.0U	50.0	15.0	ug/L

Batch Information

Analytical Batch: MMS10871
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/6/2020 11:01:54PM

Prep Batch: MXX33591
 Prep Method: E200.2
 Prep Date/Time: 9/2/2020 1:45:56PM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [MXX33591]
 Blank Spike Lab ID: 1578746
 Date Analyzed: 09/06/2020 23:04

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007,
 1204455008, 1204455009, 1204455010, 1204455011, 1204455012, 1204455017, 1204455018,
 1204455019, 1204455020, 1204455021, 1204455022, 1204455023, 1204455024

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	10900	109	(85-115)
Copper	1000	1090	109	(85-115)
Magnesium	10000	10900	109	(85-115)

Batch Information

Analytical Batch: **MMS10871**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **DMM**

Prep Batch: **MXX33591**
 Prep Method: **E200.2**
 Prep Date/Time: **09/02/2020 13:45**
 Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1204455001
 MS Sample ID: 1578748 MS
 MSD Sample ID:

Analysis Date: 09/06/2020 23:07
 Analysis Date: 09/06/2020 23:10
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007,
 1204455008, 1204455009, 1204455010, 1204455011, 1204455012, 1204455017, 1204455018,
 1204455019, 1204455020, 1204455021, 1204455022, 1204455023, 1204455024

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Calcium	11300	10000	21700	104				70-130		
Magnesium	4580	10000	14900	104				70-130		

Batch Information

Analytical Batch: MMS10871
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/6/2020 11:10:53PM

Prep Batch: MXX33591
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/2/2020 1:45:56PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/15/2020 8:39:00AM

Billable Matrix Spike Summary

Original Sample ID: 1204455011
 MS Sample ID: 1204455013 BMS
 MSD Sample ID: 1204455014 BMSD

Analysis Date: 09/07/2020 0:01
 Analysis Date: 09/06/2020 23:22
 Analysis Date: 09/06/2020 23:25
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Calcium	17900	10000	28000	101	10000	28600	107	70-130	2.20	(< 20)
Magnesium	4200	10000	15100	109	10000	15100	109	70-130	0.12	(< 20)

Batch Information

Analytical Batch: MMS10871
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/6/2020 11:22:54PM

Prep Batch: MXX33591
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/2/2020 1:45:56PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/15/2020 8:39:00AM

Method Blank

Blank ID: MB for HBN 1811194 [MXX/33592]
Blank Lab ID: 1578749

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204455025, 1204455026, 1204455027, 1204455028

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Copper	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: MMS10877
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 9/13/2020 12:08:02PM

Prep Batch: MXX33592
Prep Method: E200.2
Prep Date/Time: 9/2/2020 4:15:43PM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/15/2020 8:39:04AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [MXX33592]
 Blank Spike Lab ID: 1578750
 Date Analyzed: 09/13/2020 12:11

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455025, 1204455026, 1204455027, 1204455028

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Copper	1000	1060	106	(85-115)

Batch Information

Analytical Batch: **MMS10877**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **DMM**

Prep Batch: **MXX33592**
 Prep Method: **E200.2**
 Prep Date/Time: **09/02/2020 16:15**
 Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/15/2020 8:39:06AM

Matrix Spike Summary

Original Sample ID: 1578752
 MS Sample ID: 1578753 MS
 MSD Sample ID:

Analysis Date: 09/13/2020 12:29
 Analysis Date: 09/13/2020 12:32
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455025, 1204455026, 1204455027, 1204455028

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	5.28	1000	1080	108				70-130		

Batch Information

Analytical Batch: MMS10877
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/13/2020 12:32:12PM

Prep Batch: MXX33592
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/2/2020 4:15:43PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/15/2020 8:39:08AM

Matrix Spike Summary

Original Sample ID: 1578754
 MS Sample ID: 1578755 MS
 MSD Sample ID:

Analysis Date: 09/13/2020 12:23
 Analysis Date: 09/13/2020 12:26
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	32.0	1000	1050	101				70-130		

Batch Information

Analytical Batch: MMS10877
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/13/2020 12:26:15PM

Prep Batch: MXX33592
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/2/2020 4:15:43PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/15/2020 8:39:08AM

Billable Matrix Spike Summary

Original Sample ID: 1204455027
 MS Sample ID: 1204455029 BMS
 MSD Sample ID: 1204455030 BMSD

Analysis Date: 09/13/2020 12:41
 Analysis Date: 09/13/2020 12:32
 Analysis Date: 09/13/2020 12:35
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	4.79	1000	1080	108	1000	1050	105	70-130	3.00	(< 20)

Batch Information

Analytical Batch: MMS10877
 Analytical Method: EP200.8
 Instrument: Perkin Elmer NexIon P5
 Analyst: DMM
 Analytical Date/Time: 9/13/2020 12:32:12PM

Prep Batch: MXX33592
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/2/2020 4:15:43PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/15/2020 8:39:08AM



Method Blank

Blank ID: MB for HBN 1810854 [STS/6776]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1577242

QC for Samples:

1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009

Results by SM21 2540D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Suspended Solids	0.500U	1.00	0.310	mg/L

Batch Information

Analytical Batch: STS6776

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Analytical Date/Time: 8/26/2020 3:40:52PM

Print Date: 09/15/2020 8:39:10AM

Duplicate Sample Summary

Original Sample ID: 1204384001

Duplicate Sample ID: 1577245

QC for Samples:

Analysis Date: 08/26/2020 15:40

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	4.75	5.25	mg/L	10.00*	(< 5)

Batch Information

Analytical Batch: STS6776

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/15/2020 8:39:11AM

Duplicate Sample Summary

Original Sample ID: 1204432001

Duplicate Sample ID: 1577246

QC for Samples:

1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009

Analysis Date: 08/26/2020 15:40

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	16.4	16.4	mg/L	0.00	(< 5)

Batch Information

Analytical Batch: STS6776

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/15/2020 8:39:11AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [STS6776]
 Blank Spike Lab ID: 1577243
 Date Analyzed: 08/26/2020 15:40

Spike Duplicate ID: LCSD for HBN 1204455 [STS6776]
 Spike Duplicate Lab ID: 1577244
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455001, 1204455002, 1204455003, 1204455004, 1204455005, 1204455006, 1204455007, 1204455008, 1204455009

Results by SM21 2540D

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Total Suspended Solids	25	24.4	98	25	24.0	96	(75-125)	1.70	(< 5)

Batch Information

Analytical Batch: STS6776
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Method Blank

Blank ID: MB for HBN 1810983 [STS/6777]

Blank Lab ID: 1577786

QC for Samples:

1204455010, 1204455011, 1204455012

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Suspended Solids	0.500U	1.00	0.310	mg/L

Batch Information

Analytical Batch: STS6777

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Analytical Date/Time: 8/28/2020 3:14:17PM

Print Date: 09/15/2020 8:39:15AM

Duplicate Sample Summary

Original Sample ID: 1204455011

Duplicate Sample ID: 1577789

QC for Samples:

1204455010, 1204455011, 1204455012

Analysis Date: 08/28/2020 15:14

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	20.0	23.4	mg/L	15.70*	(< 5)

Batch Information

Analytical Batch: STS6777

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/15/2020 8:39:16AM

Duplicate Sample Summary

Original Sample ID: 1204563004

Duplicate Sample ID: 1577790

QC for Samples:

Analysis Date: 08/28/2020 15:14

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	295	301	mg/L	2.00	(< 5)

Batch Information

Analytical Batch: STS6777

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/15/2020 8:39:16AM

Duplicate Sample Summary

Original Sample ID: 1204455011
 Duplicate Sample ID: 1204455015
 QC for Samples:

Analysis Date: 08/28/2020 15:14
 Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	20.0	23.4	mg/L	15.70*	(< 5)

Batch Information

Analytical Batch: STS6777
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Print Date: 09/15/2020 8:39:16AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [STS6777]
 Blank Spike Lab ID: 1577787
 Date Analyzed: 08/28/2020 15:14

Spike Duplicate ID: LCSD for HBN 1204455
 [STS6777]
 Spike Duplicate Lab ID: 1577788
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455010, 1204455011, 1204455012

Results by SM21 2540D

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Total Suspended Solids	25	25.4	102	25	25.4	102	(75-125)	0.00	(< 5)

Batch Information

Analytical Batch: STS6777
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Print Date: 09/15/2020 8:39:18AM

Method Blank

Blank ID: MB for HBN 1810892 [VXX/36213]
 Blank Lab ID: 1577451

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1204455003, 1204455005, 1204455008, 1204455011, 1204455012, 1204455016

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	81-118		%
4-Bromofluorobenzene (surr)	108	85-114		%
Toluene-d8 (surr)	103	89-112		%

Batch Information

Analytical Batch: VMS20246
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 8/25/2020 3:29:00PM

Prep Batch: VXX36213
 Prep Method: SW5030B
 Prep Date/Time: 8/25/2020 12:00:00PM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [VXX36213]
 Blank Spike Lab ID: 1577452
 Date Analyzed: 08/25/2020 13:17

Spike Duplicate ID: LCSD for HBN 1204455 [VXX36213]
 Spike Duplicate Lab ID: 1577453
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455003, 1204455005, 1204455008, 1204455011, 1204455012, 1204455016

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	29.6	99	30	29.6	99	(79-120)	0.26	(< 20)
Ethylbenzene	30	30.6	102	30	29.8	99	(79-121)	2.70	(< 20)
o-Xylene	30	30.6	102	30	30.1	100	(78-122)	1.70	(< 20)
P & M -Xylene	60	61.1	102	60	59.8	100	(80-121)	2.20	(< 20)
Toluene	30	28.3	94	30	27.7	92	(80-121)	2.10	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98.4	98	30	98.2	98	(81-118)	0.21	
4-Bromofluorobenzene (surr)	30	104	104	30	102	102	(85-114)	2.10	
Toluene-d8 (surr)	30	99.7	100	30	99.6	100	(89-112)	0.14	

Batch Information

Analytical Batch: **VMS20246**
 Analytical Method: **EPA 602/624**
 Instrument: **Agilent 7890-75MS**
 Analyst: **NRB**

Prep Batch: **VXX36213**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/25/2020 12:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Billable Matrix Spike Summary

Original Sample ID: 1204455011
 MS Sample ID: 1204455013 BMS
 MSD Sample ID: 1204455014 BMSD

Analysis Date: 08/25/2020 19:53
 Analysis Date: 08/25/2020 13:47
 Analysis Date: 08/25/2020 14:01
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	31.9	106	30.0	31.3	104	79-120	1.80	(< 20)
Ethylbenzene	0.500U	30.0	33.7	112	30.0	33.1	110	79-121	1.70	(< 20)
o-Xylene	0.500U	30.0	33.8	113	30.0	33.1	110	78-122	2.10	(< 20)
P & M -Xylene	1.00U	60.0	66.2	110	60.0	66.0	110	80-121	0.23	(< 20)
Toluene	0.500U	30.0	31.5	105	30.0	30.7	102	80-121	2.70	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.5	99	30.0	29.2	97	81-118	1.30	
4-Bromofluorobenzene (surr)		30.0	30.9	103	30.0	31.1	104	85-114	0.85	
Toluene-d8 (surr)		30.0	30.5	102	30.0	30.0	100	89-112	1.60	

Batch Information

Analytical Batch: VMS20246
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 8/25/2020 1:47:00PM

Prep Batch: VXX36213
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 8/25/2020 12:00:00PM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL



Method Blank

Blank ID: MB for HBN 1810965 [XXX/43753]
Blank Lab ID: 1577735

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204455003, 1204455005, 1204455008, 1204455011, 1204455012

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	52	37-78		%
Fluoranthene-d10 (surr)	65.8	24-116		%

Batch Information

Analytical Batch: XMS12240
Analytical Method: EPA 625M SIM (PAH) LV
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 8/31/2020 4:18:00PM

Prep Batch: XXX43753
Prep Method: SW3535A
Prep Date/Time: 8/28/2020 12:10:28PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/15/2020 8:39:25AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204455 [XXX43753]
 Blank Spike Lab ID: 1577736
 Date Analyzed: 08/31/2020 16:38

Spike Duplicate ID: LCSD for HBN 1204455
 [XXX43753]
 Spike Duplicate Lab ID: 1577737
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455003, 1204455005, 1204455008, 1204455011, 1204455012

Results by EPA 625M SIM (PAH) LV

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	2	1.31	66	2	1.28	64	(48-114)	2.40	(< 20)
Acenaphthylene	2	1.46	73	2	1.43	71	(35-121)	2.00	(< 20)
Anthracene	2	1.45	72	2	1.44	72	(53-119)	0.57	(< 20)
Benzo(a)Anthracene	2	1.28	64	2	1.31	66	(59-120)	2.80	(< 20)
Benzo[a]pyrene	2	1.64	82	2	1.65	82	(53-120)	0.70	(< 20)
Benzo[b]Fluoranthene	2	1.52	76	2	1.58	79	(53-126)	3.80	(< 20)
Benzo[g,h,i]perylene	2	1.74	87	2	1.73	87	(44-128)	0.49	(< 20)
Benzo[k]fluoranthene	2	1.59	80	2	1.60	80	(54-125)	0.33	(< 20)
Chrysene	2	1.54	77	2	1.56	78	(57-120)	1.10	(< 20)
Dibenzo[a,h]anthracene	2	1.79	90	2	1.75	88	(44-131)	2.00	(< 20)
Fluoranthene	2	1.44	72	2	1.46	73	(58-120)	1.40	(< 20)
Fluorene	2	1.41	71	2	1.39	70	(50-118)	1.20	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.84	92	2	1.83	92	(48-130)	0.39	(< 20)
Naphthalene	2	1.21	61	2	1.18	59	(43-114)	2.30	(< 20)
Phenanthrene	2	1.43	72	2	1.40	70	(53-115)	2.10	(< 20)
Pyrene	2	1.42	71	2	1.41	71	(53-121)	0.55	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	52	52	2	51.1	51	(37-78)	1.70	
Fluoranthene-d10 (surr)	2	65.3	65	2	65.5	66	(24-116)	0.30	

Batch Information

Analytical Batch: XMS12240
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD

Prep Batch: XXX43753
 Prep Method: SW3535A
 Prep Date/Time: 08/28/2020 12:10
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL



Matrix Spike Summary

Original Sample ID: 1204455012
 MS Sample ID: 1577851 MS
 MSD Sample ID: 1577852 MSD

Analysis Date: 08/31/2020 18:42
 Analysis Date: 08/31/2020 19:03
 Analysis Date: 08/31/2020 19:23
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204455003, 1204455005, 1204455008, 1204455011, 1204455012

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0250U	1.92	1.41	73	1.92	1.30	67	48-114	8.40	(< 20)
Acenaphthylene	0.0250U	1.92	1.48	77	1.92	1.41	73	35-121	5.00	(< 20)
Anthracene	0.0250U	1.92	1.55	81	1.92	1.46	76	53-119	5.70	(< 20)
Benzo(a)Anthracene	0.0250U	1.92	1.41	73	1.92	1.34	70	59-120	5.00	(< 20)
Benzo[a]pyrene	0.0100U	1.92	1.73	90	1.92	1.64	85	53-120	5.50	(< 20)
Benzo[b]Fluoranthene	0.0250U	1.92	1.68	88	1.92	1.64	85	53-126	2.70	(< 20)
Benzo[g,h,i]perylene	0.0250U	1.92	1.71	89	1.92	1.63	85	44-128	5.20	(< 20)
Benzo[k]fluoranthene	0.0250U	1.92	1.68	87	1.92	1.56	81	54-125	7.30	(< 20)
Chrysene	0.0250U	1.92	1.64	85	1.92	1.56	81	57-120	5.30	(< 20)
Dibenzo[a,h]anthracene	0.0100U	1.92	1.78	92	1.92	1.67	87	44-131	5.90	(< 20)
Fluoranthene	0.0250U	1.92	1.61	84	1.92	1.53	80	58-120	4.80	(< 20)
Fluorene	0.0250U	1.92	1.51	79	1.92	1.42	74	50-118	6.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0250U	1.92	1.86	97	1.92	1.75	91	48-130	5.90	(< 20)
Naphthalene	0.0500U	1.92	1.39	73	1.92	1.30	68	43-114	6.60	(< 20)
Phenanthrene	0.0250U	1.92	1.51	78	1.92	1.43	75	53-115	4.90	(< 20)
Pyrene	0.0250U	1.92	1.57	81	1.92	1.49	77	53-121	5.10	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	1.25	65	1.92	1.14	59	37-78	9.50	
Fluoranthene-d10 (surr)		1.92	1.45	75	1.92	1.38	72	24-116	5.00	

Batch Information

Analytical Batch: XMS12240
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 8/31/2020 7:03:00PM

Prep Batch: XXX43753
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 8/28/2020 12:10:28PM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 09/15/2020 8:39:28AM



Billable Matrix Spike Summary

Original Sample ID: 1204455011
 MS Sample ID: 1204455013 BMS
 MSD Sample ID: 1204455014 BMSD

Analysis Date: 08/31/2020 18:21
 Analysis Date: 08/31/2020 19:03
 Analysis Date: 08/31/2020 19:23
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0245U	1.92	1.41	73	1.92	1.30	67	48-114	8.40	(< 20)
Acenaphthylene	0.0245U	1.92	1.48	77	1.92	1.41	73	35-121	5.00	(< 20)
Anthracene	0.0245U	1.92	1.55	81	1.92	1.46	76	53-119	5.70	(< 20)
Benzo(a)Anthracene	0.0245U	1.92	1.41	73	1.92	1.34	70	59-120	5.00	(< 20)
Benzo[a]pyrene	0.00980U	1.92	1.73	90	1.92	1.64	85	53-120	5.50	(< 20)
Benzo[b]Fluoranthene	0.0245U	1.92	1.68	88	1.92	1.64	85	53-126	2.70	(< 20)
Benzo[g,h,i]perylene	0.0245U	1.92	1.71	89	1.92	1.63	85	44-128	5.20	(< 20)
Benzo[k]fluoranthene	0.0245U	1.92	1.68	87	1.92	1.56	81	54-125	7.30	(< 20)
Chrysene	0.0245U	1.92	1.64	85	1.92	1.56	81	57-120	5.30	(< 20)
Dibenzo[a,h]anthracene	0.00980U	1.92	1.78	92	1.92	1.67	87	44-131	5.90	(< 20)
Fluoranthene	0.0245U	1.92	1.61	84	1.92	1.53	80	58-120	4.80	(< 20)
Fluorene	0.0245U	1.92	1.51	79	1.92	1.42	74	50-118	6.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0245U	1.92	1.86	97	1.92	1.75	91	48-130	5.90	(< 20)
Naphthalene	0.0490U	1.92	1.39	73	1.92	1.30	68	43-114	6.60	(< 20)
Phenanthrene	0.0245U	1.92	1.51	78	1.92	1.43	75	53-115	4.90	(< 20)
Pyrene	0.0245U	1.92	1.57	81	1.92	1.49	77	53-121	5.10	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	1.25	65	1.92	1.14	59	37-78	9.50	
Fluoranthene-d10 (surr)		1.92	1.45	75	1.92	1.38	72	24-116	5.00	

Batch Information

Analytical Batch: XMS12240
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 8/31/2020 7:03:00PM

Prep Batch: XXX43753
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 8/28/2020 12:10:28PM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 09/15/2020 8:39:28AM



SGS North America Inc.
CHAIN OF CUSTODY RECORD

1204455



www.us.sgs.com

CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>1</u> of <u>2</u>																																																																																																																																																																																																						
CONTACT: Cindy Helmericks PHONE #: 907-644-2017					Section 3		Preservative																																																																																																																																																																																																														
PROJECT NAME: MOA Stormwater Outfall Monitoring PROJECT/ PWSID/ PERMIT#: 10227978					# C O N T A I N E R S	Comp Grab MI (Multi-incremental)	None HCl Na2SO4 Analysis*										NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS																																																																																																																																																																																																				
REPORTS TO: Cindy Helmericks E-MAIL: cindy.helmericks@hdrinc.com Profile #: 358860							5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)																																																																																																																																																																																																								
INVOICE TO: HDR Inc.																																																																																																																																																																																																																					
QUOTE #: P.O. #:																																																																																																																																																																																																																					
<table border="1"> <thead> <tr> <th>RESERVED for lab use</th> <th>SAMPLE IDENTIFICATION</th> <th>DATE mm/dd/yy</th> <th>TIME HH:MM</th> <th>MATRIX/MATRIX CODE</th> <th></th> <th></th> <th>5210B - BOD</th> <th>EPA 200.8/2340B - Total Hardness</th> <th>EPA 624 - TAH</th> <th>EPA 625 SIM - TAqH</th> <th>2540D - Total Suspended Solids</th> <th>9222D - Fecal Coliform</th> <th>200.8 - Dissolved Cu (Lab Filter)</th> <th></th> <th></th> <th></th> <th>REMARKS/LOC ID</th> </tr> </thead> <tbody> <tr> <td>1AD</td> <td>SWM 03-02</td> <td>08/24/20</td> <td>11:45</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>17AB</td> </tr> <tr> <td>2AD</td> <td>SWM 04-02</td> <td></td> <td>11:50</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>18AB</td> </tr> <tr> <td>3AI</td> <td>SWM 05-02</td> <td></td> <td>13:05</td> <td>WS</td> <td>10</td> <td>G</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>19AB</td> </tr> <tr> <td>4AD</td> <td>SWM 06-02</td> <td></td> <td>10:40</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>20AB</td> </tr> <tr> <td>5AI</td> <td>SWM 07-02</td> <td></td> <td>09:00</td> <td>WS</td> <td>10</td> <td>G</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>21AB</td> </tr> <tr> <td>6AD</td> <td>SWM 08-02</td> <td></td> <td>09:15</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>22AB</td> </tr> <tr> <td>7AD</td> <td>SWM 08-02 Dup</td> <td></td> <td>09:15</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>23AB</td> </tr> <tr> <td>8AI</td> <td>SWM 09-02</td> <td></td> <td>09:45</td> <td>WS</td> <td>10</td> <td>G</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>24AB</td> </tr> <tr> <td>9AD</td> <td>SWM 10-02</td> <td></td> <td>10:05</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>25AB</td> </tr> <tr> <td>10AD</td> <td>SWM 11-02</td> <td></td> <td>11:10</td> <td>WS</td> <td>5</td> <td>G</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td></td> <td>26AB</td> </tr> </tbody> </table>												RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE			5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)				REMARKS/LOC ID	1AD	SWM 03-02	08/24/20	11:45	WS	5	G	✓	✓			✓	✓	✓				17AB	2AD	SWM 04-02		11:50	WS	5	G	✓	✓			✓	✓	✓				18AB	3AI	SWM 05-02		13:05	WS	10	G	✓	✓	✓	✓	✓	✓	✓				19AB	4AD	SWM 06-02		10:40	WS	5	G	✓	✓			✓	✓	✓				20AB	5AI	SWM 07-02		09:00	WS	10	G	✓	✓	✓	✓	✓	✓	✓				21AB	6AD	SWM 08-02		09:15	WS	5	G	✓	✓			✓	✓	✓				22AB	7AD	SWM 08-02 Dup		09:15	WS	5	G	✓	✓			✓	✓	✓				23AB	8AI	SWM 09-02		09:45	WS	10	G	✓	✓	✓	✓	✓	✓	✓				24AB	9AD	SWM 10-02		10:05	WS	5	G	✓	✓			✓	✓	✓				25AB	10AD	SWM 11-02		11:10	WS	5	G	✓	✓			✓	✓	✓				26AB	Section 4 DOD Project? Yes <input type="radio"/> No <input checked="" type="radio"/>		Data Deliverable Requirements:	
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE			5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)				REMARKS/LOC ID																																																																																																																																																																																																				
1AD	SWM 03-02	08/24/20	11:45	WS	5	G	✓	✓			✓	✓	✓				17AB																																																																																																																																																																																																				
2AD	SWM 04-02		11:50	WS	5	G	✓	✓			✓	✓	✓				18AB																																																																																																																																																																																																				
3AI	SWM 05-02		13:05	WS	10	G	✓	✓	✓	✓	✓	✓	✓				19AB																																																																																																																																																																																																				
4AD	SWM 06-02		10:40	WS	5	G	✓	✓			✓	✓	✓				20AB																																																																																																																																																																																																				
5AI	SWM 07-02		09:00	WS	10	G	✓	✓	✓	✓	✓	✓	✓				21AB																																																																																																																																																																																																				
6AD	SWM 08-02		09:15	WS	5	G	✓	✓			✓	✓	✓				22AB																																																																																																																																																																																																				
7AD	SWM 08-02 Dup		09:15	WS	5	G	✓	✓			✓	✓	✓				23AB																																																																																																																																																																																																				
8AI	SWM 09-02		09:45	WS	10	G	✓	✓	✓	✓	✓	✓	✓				24AB																																																																																																																																																																																																				
9AD	SWM 10-02		10:05	WS	5	G	✓	✓			✓	✓	✓				25AB																																																																																																																																																																																																				
10AD	SWM 11-02		11:10	WS	5	G	✓	✓			✓	✓	✓				26AB																																																																																																																																																																																																				
Relinquished By: (1) Date: 08/24/20 Time: 13:55 Received By:					Cooler ID:										Requested Turnaround Time and/or Special Instructions:																																																																																																																																																																																																						
Relinquished By: (2)					Temp Blank °C:										Chain of Custody Seal: (Circle)																																																																																																																																																																																																						
Relinquished By: (3)					1) 2.6 D50 2) 5.4 D30 3) 5.4 D45 4) 4.3 D52 5) 9.4 D51										INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT <input checked="" type="checkbox"/>																																																																																																																																																																																																						
Relinquished By: (4) Date: 8/24/20 Time: 13:55 Received For Laboratory By:					or Ambient []										Delivery Method: Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery []																																																																																																																																																																																																						



SGS North America Inc. CHAIN OF CUSTODY RECORD

1204455



www.us.sgs.com

CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.								Page <u>2</u> of <u>2</u>				
CONTACT: Cindy Helmericks					PHONE #: 907-644-2017		Section 3		Preservative								
PROJECT NAME: MOA Stormwater Outfall Monitoring					PROJECT/PWSID/PERMIT#: 10227978		CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis*								NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS
REPORTS TO: Cindy Helmericks					E-MAIL: cindy.helmericks@hdrinc.com				None	ICI	Na2SO4						
INVOICE TO: HDR Inc.					QUOTE #: P.O. #:				5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)		
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	#										REMARKS/LOC ID		
(11A)	SWM 12-02	08/24/20	12:20	WS	10	G	✓	✓	✓	✓	✓	✓			(27AB)		
(12A)	SWM 12-02 Dup		12:25	WS	10	G	✓	✓	✓	✓	✓	✓			(25AB)		
(13-14)	SWM 12-02		12:30	WS	17	G	✓	✓	✓	✓	✓	✓			(22AB)MS/MSD		
(16A)	SWM TripBlank-02		09:00	WS	3	G									Trip Blanks (3)		
Relinquished By: (1) <i>Ragallo</i>					Date: 08/24/20	Time: 13:55	Received By: _____					Section 4 DOD Project? Yes <input type="radio"/> No <input checked="" type="radio"/>		Data Deliverable Requirements:			
Relinquished By: (2)					Date:	Time:	Received By: _____					Cooler ID: _____					
Relinquished By: (3)					Date:	Time:	Received By: _____					Requested Turnaround Time and/or Special Instructions:					
Relinquished By: (4)					Date: 6/24/20	Time: 1355	Received For Laboratory By: _____					Temp Blank °C: 1) 2.6 D50 2) 5.4 D30 3) 5.4 D45 4) 4.2 D52 5) 4.1 D51 or Ambient []		Chain of Custody Seal: (Circle) INTACT BROKEN <u>ABSENT</u>			
Delivery Method: Hand Delivery <input checked="" type="checkbox"/> Commerical Delivery []																	

http://www.sgs.com/terms-and-conditions



e-Sample Receipt Form

SGS Workorder #:

1204455



1 2 0 4 4 5 5

Review Criteria		Condition (Yes, No, N/A)	Exceptions Noted below	
Chain of Custody / Temperature Requirements			<input checked="" type="checkbox"/> Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	<input type="checkbox"/> N/A	Absent		
COC accompanied samples?	<input checked="" type="checkbox"/> Yes			
DOD: Were samples received in COC corresponding coolers?	<input type="checkbox"/> N/A			
<input checked="" type="checkbox"/> Yes	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required			
Temperature blank compliant* (i.e., 0-6 °C after CF)?	<input checked="" type="checkbox"/> Yes	Cooler ID:	1	@ 2.6 °C Therm. ID: D50
	<input checked="" type="checkbox"/> Yes	Cooler ID:	2	@ 5.4 °C Therm. ID: D30
	<input checked="" type="checkbox"/> Yes	Cooler ID:	3	@ 5.4 °C Therm. ID: D45
	<input checked="" type="checkbox"/> Yes	Cooler ID:	4	@ 4.2 °C Therm. ID: D52
	<input type="checkbox"/> No	Cooler ID:	5	@ 9.4 °C Therm. ID: D51
*If >6°C, were samples collected <8 hours ago?		<input checked="" type="checkbox"/> Yes		
If <0°C, were sample containers ice free?		<input type="checkbox"/> N/A		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.				
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?	<input checked="" type="checkbox"/> Yes			
Do samples match COC** (i.e., sample IDs, dates/times collected)?	<input checked="" type="checkbox"/> Yes			
**Note: If times differ <1hr, record details & login per COC.				
***Note: If sample information on containers differs from COC, SGS will default to COC information				
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	<input checked="" type="checkbox"/> Yes			
Were proper containers (type/mass/volume/preservative***) used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> N/A	***Exemption permitted for metals (e.g,200.8/6020A).	
Volatile / LL-Hg Requirements				
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<input checked="" type="checkbox"/> Yes			
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	<input checked="" type="checkbox"/> Yes			
Were all soil VOAs field extracted with MeOH+BFB?	<input type="checkbox"/> N/A			
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.				
Additional notes (if applicable):				



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204455001-A	No Preservative Required	OK	1204455009-D	Na2S2O3 for Chlorine Redu	OK
1204455001-B	HNO3 to pH < 2	OK	1204455010-A	No Preservative Required	OK
1204455001-C	No Preservative Required	OK	1204455010-B	HNO3 to pH < 2	OK
1204455001-D	Na2S2O3 for Chlorine Redu	OK	1204455010-C	No Preservative Required	OK
1204455002-A	No Preservative Required	OK	1204455010-D	Na2S2O3 for Chlorine Redu	OK
1204455002-B	HNO3 to pH < 2	OK	1204455011-A	No Preservative Required	OK
1204455002-C	No Preservative Required	OK	1204455011-B	HNO3 to pH < 2	OK
1204455002-D	Na2S2O3 for Chlorine Redu	OK	1204455011-C	No Preservative Required	OK
1204455003-A	No Preservative Required	OK	1204455011-D	Na2S2O3 for Chlorine Redu	OK
1204455003-B	HNO3 to pH < 2	OK	1204455011-E	No Preservative Required	OK
1204455003-C	No Preservative Required	OK	1204455011-F	No Preservative Required	OK
1204455003-D	Na2S2O3 for Chlorine Redu	OK	1204455011-G	HCL to pH < 2	OK
1204455003-E	No Preservative Required	OK	1204455011-H	HCL to pH < 2	OK
1204455003-F	No Preservative Required	OK	1204455011-I	HCL to pH < 2	OK
1204455003-G	HCL to pH < 2	OK	1204455012-A	No Preservative Required	OK
1204455003-H	HCL to pH < 2	OK	1204455012-B	HNO3 to pH < 2	OK
1204455003-I	HCL to pH < 2	OK	1204455012-C	No Preservative Required	OK
1204455004-A	No Preservative Required	OK	1204455012-D	Na2S2O3 for Chlorine Redu	OK
1204455004-B	HNO3 to pH < 2	OK	1204455012-E	No Preservative Required	OK
1204455004-C	No Preservative Required	OK	1204455012-F	No Preservative Required	OK
1204455004-D	Na2S2O3 for Chlorine Redu	OK	1204455012-G	HCL to pH < 2	OK
1204455005-A	No Preservative Required	OK	1204455012-H	HCL to pH < 2	OK
1204455005-B	HNO3 to pH < 2	OK	1204455012-I	HCL to pH < 2	OK
1204455005-C	No Preservative Required	OK	1204455013-A	HNO3 to pH < 2	OK
1204455005-D	Na2S2O3 for Chlorine Redu	OK	1204455013-B	No Preservative Required	OK
1204455005-E	No Preservative Required	OK	1204455013-C	No Preservative Required	OK
1204455005-F	No Preservative Required	OK	1204455013-D	HCL to pH < 2	OK
1204455005-G	HCL to pH < 2	OK	1204455013-E	HCL to pH < 2	OK
1204455005-H	HCL to pH < 2	OK	1204455013-F	HCL to pH < 2	OK
1204455005-I	HCL to pH < 2	OK	1204455014-A	HNO3 to pH < 2	OK
1204455006-A	No Preservative Required	OK	1204455014-B	No Preservative Required	OK
1204455006-B	HNO3 to pH < 2	OK	1204455014-C	No Preservative Required	OK
1204455006-C	No Preservative Required	OK	1204455014-D	HCL to pH < 2	OK
1204455006-D	Na2S2O3 for Chlorine Redu	OK	1204455014-E	HCL to pH < 2	OK
1204455007-A	No Preservative Required	OK	1204455014-F	HCL to pH < 2	OK
1204455007-B	HNO3 to pH < 2	OK	1204455015-A	No Preservative Required	OK
1204455007-C	No Preservative Required	OK	1204455015-B	No Preservative Required	OK
1204455007-D	Na2S2O3 for Chlorine Redu	OK	1204455015-C	Na2S2O3 for Chlorine Redu	OK
1204455008-A	No Preservative Required	OK	1204455016-A	HCL to pH < 2	OK
1204455008-B	HNO3 to pH < 2	OK	1204455016-B	HCL to pH < 2	OK
1204455008-C	No Preservative Required	OK	1204455016-C	HCL to pH < 2	OK
1204455008-D	Na2S2O3 for Chlorine Redu	OK	1204455017-A	No Preservative Required	OK
1204455008-E	No Preservative Required	OK	1204455017-B	HNO3 to pH < 2	OK
1204455008-F	No Preservative Required	OK	1204455018-A	No Preservative Required	OK
1204455008-G	HCL to pH < 2	OK	1204455018-B	HNO3 to pH < 2	OK
1204455008-H	HCL to pH < 2	OK	1204455019-A	No Preservative Required	OK
1204455008-I	HCL to pH < 2	OK	1204455019-B	HNO3 to pH < 2	OK
1204455009-A	No Preservative Required	OK	1204455020-A	No Preservative Required	OK
1204455009-B	HNO3 to pH < 2	OK	1204455020-B	HNO3 to pH < 2	OK
1204455009-C	No Preservative Required	OK	1204455021-A	No Preservative Required	OK

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204455021-B	HNO3 to pH < 2	OK			
1204455022-A	No Preservative Required	OK			
1204455022-B	HNO3 to pH < 2	OK			
1204455023-A	No Preservative Required	OK			
1204455023-B	HNO3 to pH < 2	OK			
1204455024-A	No Preservative Required	OK			
1204455024-B	HNO3 to pH < 2	OK			
1204455025-A	No Preservative Required	OK			
1204455025-B	HNO3 to pH < 2	OK			
1204455026-A	No Preservative Required	OK			
1204455026-B	HNO3 to pH < 2	OK			
1204455027-A	No Preservative Required	OK			
1204455027-B	HNO3 to pH < 2	OK			
1204455028-A	No Preservative Required	OK			
1204455028-B	HNO3 to pH < 2	OK			
1204455029-A	No Preservative Required	OK			
1204455029-B	HNO3 to pH < 2	OK			
1204455030-A	No Preservative Required	OK			
1204455030-B	HNO3 to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

Appendix C3
Laboratory Data Package
Storm Event #3



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
2525 C Street, #500
Anchorage, AK 99503
(907)644-2017

Report Number: **1204625**

Client Project: **10227978 MOA StmWtr Outfall Mo**

Dear Cynthia Helmericks,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1204625**
Project Name/Site: **10227978 MOA StmWtr Outfall Mo**
Project Contact: **Cynthia Helmericks**

Refer to sample receipt form for information on sample condition.

1204564001DUP (1578603) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Refer to LCS/LCSD RPD for batch precision.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 09/17/2020 12:24:43PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.



Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
SWM 03-03	1204625001	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 04-03	1204625002	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 05-03	1204625003	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 06-03	1204625004	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 07-03	1204625005	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 08-03	1204625006	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 08-03 Dup	1204625007	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 09-03	1204625008	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 10-03	1204625009	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 11-03	1204625010	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03	1204625011	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 Dup	1204625012	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 MS	1204625013	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 MSD	1204625014	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM TripBlank-03	1204625015	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 Dup	1204625016	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 03-03	1204625017	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 04-03	1204625018	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 05-03	1204625019	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 06-03	1204625020	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 07-03	1204625021	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 08-03	1204625022	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 08-03 Dup	1204625023	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 09-03	1204625024	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 10-03	1204625025	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 11-03	1204625026	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03	1204625027	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 Dup	1204625028	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 MS	1204625029	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)
SWM 12-03 MSD	1204625030	08/31/2020	08/31/2020	Water (Surface, Eff., Ground)

Print Date: 09/17/2020 12:24:46PM

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
<u>Method</u>	<u>Method Description</u>			
EPA 602/624	602 Aromatics by 624 (W)			
EPA 625M SIM (PAH) LV	625 PAH SIM GC/MS Low Volume			
SM21 5210B	Biochemical Oxygen Demand SM21 5210B			
SM21 9222D	Fecal Coliform (MF)			
SM21 2340B	Hardness as CaCO3 by ICP-MS			
EP200.8	Metals in Drinking Water by ICP-MS DISSO			
EP200.8	Metals in Water by 200.8 ICP-MS			
SM21 2540D	Total Suspended Solids SM20 2540D			

Print Date: 09/17/2020 12:24:46PM

Detectable Results Summary

Client Sample ID: **SWM 03-03**

Lab Sample ID: 1204625001

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	11600	ug/L
Hardness as CaCO3	47.5	mg/L
Magnesium	4470	ug/L
Fecal Coliform	1060	col/100mL
Total Suspended Solids	4.02	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 04-03**

Lab Sample ID: 1204625002

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	21300	ug/L
Hardness as CaCO3	76.6	mg/L
Magnesium	5660	ug/L
Fecal Coliform	2800	col/100mL
Total Suspended Solids	3.78	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 05-03**

Lab Sample ID: 1204625003

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Magnesium	54.0	ug/L
Fecal Coliform	5200	col/100mL
Total Suspended Solids	8.40	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 06-03**

Lab Sample ID: 1204625004

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	10500	ug/L
Hardness as CaCO3	39.6	mg/L
Magnesium	3260	ug/L
Biochemical Oxygen Demand	2.88	mg/L
Fecal Coliform	818	col/100mL
Total Suspended Solids	7.60	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM 07-03**

Lab Sample ID: 1204625005

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	5910	ug/L
Hardness as CaCO3	21.1	mg/L
Magnesium	1540	ug/L
Biochemical Oxygen Demand	10.6	mg/L
Fecal Coliform	5350	col/100mL
Fluoranthene	0.134	ug/L
Phenanthrene	0.0808	ug/L
Pyrene	0.209	ug/L
Total Suspended Solids	123	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Detectable Results Summary

Client Sample ID: **SWM 08-03**

Lab Sample ID: 1204625006

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	6930	ug/L
Hardness as CaCO3	24.7	mg/L
Magnesium	1790	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	6.87	mg/L
Fecal Coliform	3200	col/100mL
Total Suspended Solids	35.2	mg/L

Waters Department

Client Sample ID: **SWM 08-03 Dup**

Lab Sample ID: 1204625007

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	6570	ug/L
Hardness as CaCO3	22.8	mg/L
Magnesium	1540	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	8.37	mg/L
Fecal Coliform	3400	col/100mL
Total Suspended Solids	37.4	mg/L

Waters Department

Client Sample ID: **SWM 09-03**

Lab Sample ID: 1204625008

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7680	ug/L
Hardness as CaCO3	26.6	mg/L
Magnesium	1790	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	4.70	mg/L
Fecal Coliform	3100	col/100mL

Polynuclear Aromatics GC/MS

Benzo[g,h,i]perylene	0.0685	ug/L
Chrysene	0.132	ug/L
Fluoranthene	0.171	ug/L
Phenanthrene	0.0585	ug/L
Pyrene	0.132	ug/L
Toluene	0.348J	ug/L
Total Suspended Solids	32.6	mg/L

Volatile GC/MS

Waters Department

Client Sample ID: **SWM 10-03**

Lab Sample ID: 1204625009

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	11300	ug/L
Hardness as CaCO3	41.3	mg/L
Magnesium	3180	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	2.04	mg/L
Fecal Coliform	627	col/100mL

Waters Department

Total Suspended Solids	22.0	mg/L
------------------------	------	------

Detectable Results Summary

Client Sample ID: **SWM 11-03**

Lab Sample ID: 1204625010

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	5080	ug/L
Hardness as CaCO3	15.9	mg/L
Magnesium	787	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	2.80	mg/L
Fecal Coliform	430	col/100mL
Total Suspended Solids	12.8	mg/L

Waters Department

Client Sample ID: **SWM 12-03**

Lab Sample ID: 1204625011

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	22900	ug/L
Hardness as CaCO3	81.3	mg/L
Magnesium	5840	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	4.23	mg/L
Fecal Coliform	3800	col/100mL

Polynuclear Aromatics GC/MS

Fluoranthene	0.0742	ug/L
Phenanthrene	0.0648	ug/L
Pyrene	0.0871	ug/L
Total Suspended Solids	76.0	mg/L

Waters Department

Client Sample ID: **SWM 12-03 Dup**

Lab Sample ID: 1204625012

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	23400	ug/L
Hardness as CaCO3	81.9	mg/L
Magnesium	5720	ug/L

Microbiology Laboratory

Biochemical Oxygen Demand	3.91	mg/L
Fecal Coliform	3000	col/100mL

Polynuclear Aromatics GC/MS

Fluoranthene	0.0651	ug/L
Phenanthrene	0.0614	ug/L
Pyrene	0.0785	ug/L
Total Suspended Solids	72.5	mg/L

Waters Department

Client Sample ID: **SWM 03-03**

Lab Sample ID: 1204625017

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	1.81	ug/L

Client Sample ID: **SWM 04-03**

Lab Sample ID: 1204625018

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.48	ug/L

Client Sample ID: **SWM 05-03**

Lab Sample ID: 1204625019

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.81	ug/L

Client Sample ID: **SWM 06-03**

Lab Sample ID: 1204625020

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.72	ug/L

Detectable Results Summary

Client Sample ID: SWM 07-03			
Lab Sample ID: 1204625021	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	8.39	ug/L
Client Sample ID: SWM 08-03			
Lab Sample ID: 1204625022	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	2.94	ug/L
Client Sample ID: SWM 08-03 Dup			
Lab Sample ID: 1204625023	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	3.42	ug/L
Client Sample ID: SWM 09-03			
Lab Sample ID: 1204625024	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	2.31	ug/L
Client Sample ID: SWM 10-03			
Lab Sample ID: 1204625025	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	0.881J	ug/L
Client Sample ID: SWM 11-03			
Lab Sample ID: 1204625026	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	1.82	ug/L
Client Sample ID: SWM 12-03			
Lab Sample ID: 1204625027	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	3.88	ug/L
Client Sample ID: SWM 12-03 Dup			
Lab Sample ID: 1204625028	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	4.22	ug/L

Print Date: 09/17/2020 12:24:48PM



Results of **SWM 03-03**

Client Sample ID: **SWM 03-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625001
Lab Project ID: 1204625

Collection Date: 08/31/20 09:55
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	11600	500	150	ug/L	1		09/16/20 18:33
Magnesium	4470	50.0	15.0	ug/L	1		09/16/20 18:33

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:33
Container ID: 1204625001-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	47.5	5.00	5.00	mg/L	1		09/16/20 18:33

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:33
Container ID: 1204625001-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 03-03**

Client Sample ID: **SWM 03-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625001
Lab Project ID: 1204625

Collection Date: 08/31/20 09:55
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625001-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1060	9.09	9.09	col/100mL	1		08/31/20 16:25

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: M.A
Analytical Date/Time: 08/31/20 16:25
Container ID: 1204625001-A



Results of SWM 03-03

Client Sample ID: **SWM 03-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625001
Lab Project ID: 1204625

Collection Date: 08/31/20 09:55
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	4.02	1.03	0.320	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625001-C



Results of **SWM 04-03**

Client Sample ID: **SWM 04-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625002
Lab Project ID: 1204625

Collection Date: 08/31/20 10:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	21300	500	150	ug/L	1		09/16/20 18:36
Magnesium	5660	50.0	15.0	ug/L	1		09/16/20 18:36

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:36
Container ID: 1204625002-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	76.6	5.00	5.00	mg/L	1		09/16/20 18:36

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:36
Container ID: 1204625002-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 04-03**

Client Sample ID: **SWM 04-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625002
Lab Project ID: 1204625

Collection Date: 08/31/20 10:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625002-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2800	100	100	col/100mL	1		08/31/20 16:25

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: M.A
Analytical Date/Time: 08/31/20 16:25
Container ID: 1204625002-A



Results of SWM 04-03

Client Sample ID: **SWM 04-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625002
Lab Project ID: 1204625

Collection Date: 08/31/20 10:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	3.78	1.02	0.316	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625002-C



Results of **SWM 05-03**

Client Sample ID: **SWM 05-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625003
Lab Project ID: 1204625

Collection Date: 08/31/20 11:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	250 U	500	150	ug/L	1		09/16/20 18:45
Magnesium	54.0	50.0	15.0	ug/L	1		09/16/20 18:45

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:45
Container ID: 1204625003-D

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	5.00 U	5.00	5.00	mg/L	1		09/16/20 18:45

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:45
Container ID: 1204625003-D

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 05-03**

Client Sample ID: **SWM 05-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625003
Lab Project ID: 1204625

Collection Date: 08/31/20 11:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625003-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	5200	100	100	col/100mL	1		08/31/20 16:25

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: M.A
Analytical Date/Time: 08/31/20 16:25
Container ID: 1204625003-A



Results of SWM 05-03

Client Sample ID: SWM 05-03
Client Project ID: 10227978 MOA StmWtr Outfall Mo
Lab Sample ID: 1204625003
Lab Project ID: 1204625

Collection Date: 08/31/20 11:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate values.

Batch Information

Analytical Batch: XMS12256
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 09/10/20 00:32
Container ID: 1204625003-E

Prep Batch: XXX43792
Prep Method: SW3535A
Prep Date/Time: 09/03/20 09:22
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of SWM 05-03

Client Sample ID: **SWM 05-03**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625003
 Lab Project ID: 1204625

Collection Date: 08/31/20 11:00
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/31/20 22:06
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:06
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:06
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/20 22:06
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:06
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		08/31/20 22:06
4-Bromofluorobenzene (surr)	106	85-114		%	1		08/31/20 22:06
Toluene-d8 (surr)	106	89-112		%	1		08/31/20 22:06

Batch Information

Analytical Batch: VMS20267
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/31/20 22:06
 Container ID: 1204625003-G

Prep Batch: VXX36252
 Prep Method: SW5030B
 Prep Date/Time: 08/31/20 16:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 05-03

Client Sample ID: **SWM 05-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625003
Lab Project ID: 1204625

Collection Date: 08/31/20 11:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	8.40	1.33	0.413	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625003-C



Results of **SWM 06-03**

Client Sample ID: **SWM 06-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625004
Lab Project ID: 1204625

Collection Date: 08/31/20 11:30
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	10500	500	150	ug/L	1		09/16/20 18:48
Magnesium	3260	50.0	15.0	ug/L	1		09/16/20 18:48

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:48
Container ID: 1204625004-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	39.6	5.00	5.00	mg/L	1		09/16/20 18:48

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:48
Container ID: 1204625004-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 06-03**

Client Sample ID: **SWM 06-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625004
Lab Project ID: 1204625

Collection Date: 08/31/20 11:30
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.88	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625004-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	818	9.09	9.09	col/100mL	1		08/31/20 18:12

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 08/31/20 18:12
Container ID: 1204625004-A



Results of SWM 06-03

Client Sample ID: **SWM 06-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625004
Lab Project ID: 1204625

Collection Date: 08/31/20 11:30
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	7.60	1.00	0.310	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625004-C



Results of **SWM 07-03**

Client Sample ID: **SWM 07-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625005
Lab Project ID: 1204625

Collection Date: 08/31/20 11:45
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	5910	500	150	ug/L	1		09/16/20 18:51
Magnesium	1540	50.0	15.0	ug/L	1		09/16/20 18:51

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:51
Container ID: 1204625005-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	21.1	5.00	5.00	mg/L	1		09/16/20 18:51

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:51
Container ID: 1204625005-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 07-03**

Client Sample ID: **SWM 07-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625005
Lab Project ID: 1204625

Collection Date: 08/31/20 11:45
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	10.6	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625005-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	5350	9.09	9.09	col/100mL	1		08/31/20 18:12

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 08/31/20 18:12
Container ID: 1204625005-A



Results of SWM 07-03

Client Sample ID: SWM 07-03
Client Project ID: 10227978 MOA StmWtr Outfall Mo
Lab Sample ID: 1204625005
Lab Project ID: 1204625

Collection Date: 08/31/20 11:45
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated values.

Batch Information

Analytical Batch: XMS12254
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 09/08/20 15:16
Container ID: 1204625005-E

Prep Batch: XXX43792
Prep Method: SW3535A
Prep Date/Time: 09/03/20 09:22
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL



Results of **SWM 07-03**

Client Sample ID: **SWM 07-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625005
Lab Project ID: 1204625

Collection Date: 08/31/20 11:45
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/31/20 22:21
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:21
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:21
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/20 22:21
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:21
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/31/20 22:21
4-Bromofluorobenzene (surr)	106	85-114		%	1		08/31/20 22:21
Toluene-d8 (surr)	104	89-112		%	1		08/31/20 22:21

Batch Information

Analytical Batch: VMS20267
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/31/20 22:21
Container ID: 1204625005-G

Prep Batch: VXX36252
Prep Method: SW5030B
Prep Date/Time: 08/31/20 16:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of SWM 07-03

Client Sample ID: **SWM 07-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625005
Lab Project ID: 1204625

Collection Date: 08/31/20 11:45
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	123	9.09	2.82	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625005-C



Results of **SWM 08-03**

Client Sample ID: **SWM 08-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625006
Lab Project ID: 1204625

Collection Date: 08/31/20 12:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	6930	500	150	ug/L	1		09/16/20 18:54
Magnesium	1790	50.0	15.0	ug/L	1		09/16/20 18:54

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:54
Container ID: 1204625006-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	24.7	5.00	5.00	mg/L	1		09/16/20 18:54

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:54
Container ID: 1204625006-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 08-03**

Client Sample ID: **SWM 08-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625006
Lab Project ID: 1204625

Collection Date: 08/31/20 12:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	6.87	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625006-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	3200	100	100	col/100mL	1		08/31/20 18:12

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 08/31/20 18:12
Container ID: 1204625006-A



Results of SWM 08-03

Client Sample ID: **SWM 08-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625006
Lab Project ID: 1204625

Collection Date: 08/31/20 12:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	35.2	4.00	1.24	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625006-C



Results of **SWM 08-03 Dup**

Client Sample ID: **SWM 08-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625007
Lab Project ID: 1204625

Collection Date: 08/31/20 12:05
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	6570	500	150	ug/L	1		09/16/20 18:57
Magnesium	1540	50.0	15.0	ug/L	1		09/16/20 18:57

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:57
Container ID: 1204625007-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	22.8	5.00	5.00	mg/L	1		09/16/20 18:57

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:57
Container ID: 1204625007-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 08-03 Dup**

Client Sample ID: **SWM 08-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625007
Lab Project ID: 1204625

Collection Date: 08/31/20 12:05
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	8.37	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625007-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	3400	100	100	col/100mL	1		08/31/20 18:12

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 08/31/20 18:12
Container ID: 1204625007-A



Results of SWM 08-03 Dup

Client Sample ID: **SWM 08-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625007
Lab Project ID: 1204625

Collection Date: 08/31/20 12:05
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	37.4	2.86	0.886	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625007-C



Results of **SWM 09-03**

Client Sample ID: **SWM 09-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625008
Lab Project ID: 1204625

Collection Date: 08/31/20 12:35
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	7680	500	150	ug/L	1		09/16/20 19:00
Magnesium	1790	50.0	15.0	ug/L	1		09/16/20 19:00

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:00
Container ID: 1204625008-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	26.6	5.00	5.00	mg/L	1		09/16/20 19:00

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 19:00
Container ID: 1204625008-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 09-03**

Client Sample ID: **SWM 09-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625008
Lab Project ID: 1204625

Collection Date: 08/31/20 12:35
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.70	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625008-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	3100	100	100	col/100mL	1		08/31/20 18:12

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 08/31/20 18:12
Container ID: 1204625008-A



Results of SWM 09-03

Client Sample ID: SWM 09-03
Client Project ID: 10227978 MOA StmWtr Outfall Mo
Lab Sample ID: 1204625008
Lab Project ID: 1204625

Collection Date: 08/31/20 12:35
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated quality and detection data.

Batch Information

Analytical Batch: XMS12254
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 09/08/20 15:37
Container ID: 1204625008-E

Prep Batch: XXX43792
Prep Method: SW3535A
Prep Date/Time: 09/03/20 09:22
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of SWM 09-03

Client Sample ID: **SWM 09-03**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625008
 Lab Project ID: 1204625

Collection Date: 08/31/20 12:35
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/31/20 22:35
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:35
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/20 22:35
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/20 22:35
Toluene	0.348 J	1.00	0.310	ug/L	1		08/31/20 22:35
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		08/31/20 22:35
4-Bromofluorobenzene (surr)	106	85-114		%	1		08/31/20 22:35
Toluene-d8 (surr)	105	89-112		%	1		08/31/20 22:35

Batch Information

Analytical Batch: VMS20267
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/31/20 22:35
 Container ID: 1204625008-I

Prep Batch: VXX36252
 Prep Method: SW5030B
 Prep Date/Time: 08/31/20 16:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 09-03

Client Sample ID: **SWM 09-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625008
Lab Project ID: 1204625

Collection Date: 08/31/20 12:35
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	32.6	2.86	0.886	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625008-C



Results of **SWM 10-03**

Client Sample ID: **SWM 10-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625009
Lab Project ID: 1204625

Collection Date: 08/31/20 12:50
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	11300	500	150	ug/L	1		09/16/20 19:03
Magnesium	3180	50.0	15.0	ug/L	1		09/16/20 19:03

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:03
Container ID: 1204625009-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	41.3	5.00	5.00	mg/L	1		09/16/20 19:03

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 19:03
Container ID: 1204625009-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 10-03**

Client Sample ID: **SWM 10-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625009
Lab Project ID: 1204625

Collection Date: 08/31/20 12:50
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.04	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625009-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	627	9.09	9.09	col/100mL	1		08/31/20 18:12

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: A.A
Analytical Date/Time: 08/31/20 18:12
Container ID: 1204625009-A



Results of SWM 10-03

Client Sample ID: **SWM 10-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625009
Lab Project ID: 1204625

Collection Date: 08/31/20 12:50
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	22.0	2.00	0.620	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625009-C



Results of SWM 11-03

Client Sample ID: **SWM 11-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625010
Lab Project ID: 1204625

Collection Date: 08/31/20 09:10
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	5080	500	150	ug/L	1		09/16/20 19:06
Magnesium	787	50.0	15.0	ug/L	1		09/16/20 19:06

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:06
Container ID: 1204625010-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	15.9	5.00	5.00	mg/L	1		09/16/20 19:06

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 19:06
Container ID: 1204625010-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 11-03**

Client Sample ID: **SWM 11-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625010
Lab Project ID: 1204625

Collection Date: 08/31/20 09:10
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.80	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625010-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	430	10.0	10.0	col/100mL	1		08/31/20 16:25

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: M.A
Analytical Date/Time: 08/31/20 16:25
Container ID: 1204625010-A



Results of SWM 11-03

Client Sample ID: **SWM 11-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625010
Lab Project ID: 1204625

Collection Date: 08/31/20 09:10
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	12.8	2.00	0.620	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625010-C



Results of **SWM 12-03**

Client Sample ID: **SWM 12-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625011
Lab Project ID: 1204625

Collection Date: 08/31/20 10:20
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	22900	500	150	ug/L	1		09/16/20 18:18
Magnesium	5840	50.0	15.0	ug/L	1		09/16/20 18:18

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 18:18
Container ID: 1204625011-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	81.3	5.00	5.00	mg/L	1		09/16/20 18:18

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 18:18
Container ID: 1204625011-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 12-03**

Client Sample ID: **SWM 12-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625011
Lab Project ID: 1204625

Collection Date: 08/31/20 10:20
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.23	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625011-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	3800	100	100	col/100mL	1		08/31/20 16:25

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: M.A
Analytical Date/Time: 08/31/20 16:25
Container ID: 1204625011-A



Results of SWM 12-03

Client Sample ID: SWM 12-03
Client Project ID: 10227978 MOA StmWtr Outfall Mo
Lab Sample ID: 1204625011
Lab Project ID: 1204625

Collection Date: 08/31/20 10:20
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated values and analysis dates.

Batch Information

Analytical Batch: XMS12254
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 09/08/20 15:57
Container ID: 1204625011-H

Prep Batch: XXX43792
Prep Method: SW3535A
Prep Date/Time: 09/03/20 09:22
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of SWM 12-03

Client Sample ID: **SWM 12-03**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625011
 Lab Project ID: 1204625

Collection Date: 08/31/20 10:20
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/31/20 21:37
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/20 21:37
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/20 21:37
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/20 21:37
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/20 21:37
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		08/31/20 21:37
4-Bromofluorobenzene (surr)	105	85-114		%	1		08/31/20 21:37
Toluene-d8 (surr)	106	89-112		%	1		08/31/20 21:37

Batch Information

Analytical Batch: VMS20267
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/31/20 21:37
 Container ID: 1204625011-E

Prep Batch: VXX36252
 Prep Method: SW5030B
 Prep Date/Time: 08/31/20 16:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 12-03

Client Sample ID: **SWM 12-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625011
Lab Project ID: 1204625

Collection Date: 08/31/20 10:20
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	76.0	5.00	1.55	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625011-C



Results of **SWM 12-03 Dup**

Client Sample ID: **SWM 12-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625012
Lab Project ID: 1204625

Collection Date: 08/31/20 10:25
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	23400	500	150	ug/L	1		09/16/20 19:09
Magnesium	5720	50.0	15.0	ug/L	1		09/16/20 19:09

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:09
Container ID: 1204625012-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	81.9	5.00	5.00	mg/L	1		09/16/20 19:09

Batch Information

Analytical Batch: MMS10884
Analytical Method: SM21 2340B
Analyst: DMM
Analytical Date/Time: 09/16/20 19:09
Container ID: 1204625012-D

Prep Batch: MX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 12-03 Dup**

Client Sample ID: **SWM 12-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625012
Lab Project ID: 1204625

Collection Date: 08/31/20 10:25
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Microbiology Laboratory**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.91	2.00	2.00	mg/L	1		09/01/20 14:16

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Analyst: A.L
Analytical Date/Time: 09/01/20 14:16
Container ID: 1204625012-B

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	3000	100	100	col/100mL	1		08/31/20 16:25

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Analyst: M.A
Analytical Date/Time: 08/31/20 16:25
Container ID: 1204625012-A



Results of SWM 12-03 Dup

Client Sample ID: SWM 12-03 Dup
Client Project ID: 10227978 MOA StmWtr Outfall Mo
Lab Sample ID: 1204625012
Lab Project ID: 1204625

Collection Date: 08/31/20 10:25
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate values.

Batch Information

Analytical Batch: XMS12256
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 09/10/20 00:53
Container ID: 1204625012-E

Prep Batch: XXX43792
Prep Method: SW3535A
Prep Date/Time: 09/03/20 09:22
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of SWM 12-03 Dup

Client Sample ID: **SWM 12-03 Dup**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625012
 Lab Project ID: 1204625

Collection Date: 08/31/20 10:25
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/31/20 21:51
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/20 21:51
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/20 21:51
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/20 21:51
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/20 21:51
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/31/20 21:51
4-Bromofluorobenzene (surr)	107	85-114		%	1		08/31/20 21:51
Toluene-d8 (surr)	105	89-112		%	1		08/31/20 21:51

Batch Information

Analytical Batch: VMS20267
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/31/20 21:51
 Container ID: 1204625012-G

Prep Batch: VXX36252
 Prep Method: SW5030B
 Prep Date/Time: 08/31/20 16:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM 12-03 Dup

Client Sample ID: **SWM 12-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625012
Lab Project ID: 1204625

Collection Date: 08/31/20 10:25
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Waters Department

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	72.5	5.00	1.55	mg/L	1		09/02/20 13:18

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Analyst: S.S
Analytical Date/Time: 09/02/20 13:18
Container ID: 1204625012-C

Results of SWM TripBlank-03

Client Sample ID: **SWM TripBlank-03**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625015
 Lab Project ID: 1204625

Collection Date: 08/31/20 09:10
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location: Trip Blanks (3)

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/31/20 20:09
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/20 20:09
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/20 20:09
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/20 20:09
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/20 20:09
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/31/20 20:09
4-Bromofluorobenzene (surr)	106	85-114		%	1		08/31/20 20:09
Toluene-d8 (surr)	106	89-112		%	1		08/31/20 20:09

Batch Information

Analytical Batch: VMS20267
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/31/20 20:09
 Container ID: 1204625015-A

Prep Batch: VXX36252
 Prep Method: SW5030B
 Prep Date/Time: 08/31/20 16:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM 03-03**

Client Sample ID: **SWM 03-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625017
Lab Project ID: 1204625

Collection Date: 08/31/20 09:55
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.81	1.00	0.310	ug/L	1		09/16/20 19:12

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:12
Container ID: 1204625017-A

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 04-03

Client Sample ID: **SWM 04-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625018
Lab Project ID: 1204625

Collection Date: 08/31/20 10:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.48	1.00	0.310	ug/L	1		09/16/20 19:21

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:21
Container ID: 1204625018-A

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 05-03**

Client Sample ID: **SWM 05-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625019
Lab Project ID: 1204625

Collection Date: 08/31/20 11:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.81	1.00	0.310	ug/L	1		09/16/20 19:24

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:24
Container ID: 1204625019-A

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 06-03

Client Sample ID: **SWM 06-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625020
Lab Project ID: 1204625

Collection Date: 08/31/20 11:30
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.72	1.00	0.310	ug/L	1		09/16/20 19:27

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:27
Container ID: 1204625020-A

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of **SWM 07-03**

Client Sample ID: **SWM 07-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625021
Lab Project ID: 1204625

Collection Date: 08/31/20 11:45
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Dissolved Metals by ICP/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	8.39	1.00	0.310	ug/L	1		09/16/20 19:30

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:30
Container ID: 1204625021-A

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 08-03

Client Sample ID: **SWM 08-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625022
Lab Project ID: 1204625

Collection Date: 08/31/20 12:00
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.94	1.00	0.310	ug/L	1		09/16/20 19:33

Batch Information

Analytical Batch: MMS10884
Analytical Method: EP200.8
Analyst: DMM
Analytical Date/Time: 09/16/20 19:33
Container ID: 1204625022-A

Prep Batch: MXX33606
Prep Method: E200.2
Prep Date/Time: 09/09/20 12:13
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 08-03 Dup

Client Sample ID: **SWM 08-03 Dup**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625023
Lab Project ID: 1204625

Collection Date: 08/31/20 12:05
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.42	1.00	0.310	ug/L	1		09/14/20 21:22

Batch Information

Analytical Batch: MMS10880
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/14/20 21:22
Container ID: 1204625023-A

Prep Batch: MX33608
Prep Method: E200.2
Prep Date/Time: 09/10/20 11:51
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 09-03

Client Sample ID: **SWM 09-03**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625024
 Lab Project ID: 1204625

Collection Date: 08/31/20 12:35
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.31	1.00	0.310	ug/L	1		09/16/20 18:27

Batch Information

Analytical Batch: MMS10884
 Analytical Method: EP200.8
 Analyst: DMM
 Analytical Date/Time: 09/16/20 18:27
 Container ID: 1204625024-A

Prep Batch: MXX33606
 Prep Method: E200.2
 Prep Date/Time: 09/09/20 12:13
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of SWM 10-03

Client Sample ID: **SWM 10-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625025
Lab Project ID: 1204625

Collection Date: 08/31/20 12:50
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	0.881 J	1.00	0.310	ug/L	1		09/14/20 17:06

Batch Information

Analytical Batch: MMS10880
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/14/20 17:06
Container ID: 1204625025-A

Prep Batch: MXX33607
Prep Method: E200.2
Prep Date/Time: 09/09/20 13:26
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 11-03

Client Sample ID: **SWM 11-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625026
Lab Project ID: 1204625

Collection Date: 08/31/20 09:10
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.82	1.00	0.310	ug/L	1		09/14/20 17:32

Batch Information

Analytical Batch: MMS10880
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/14/20 17:32
Container ID: 1204625026-A

Prep Batch: MXX33607
Prep Method: E200.2
Prep Date/Time: 09/09/20 13:26
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL



Results of SWM 12-03

Client Sample ID: **SWM 12-03**
Client Project ID: **10227978 MOA StmWtr Outfall Mo**
Lab Sample ID: 1204625027
Lab Project ID: 1204625

Collection Date: 08/31/20 10:20
Received Date: 08/31/20 13:29
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	3.88	1.00	0.310	ug/L	1		09/14/20 17:23

Batch Information

Analytical Batch: MMS10880
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/14/20 17:23
Container ID: 1204625027-A

Prep Batch: MXX33607
Prep Method: E200.2
Prep Date/Time: 09/09/20 13:26
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Results of SWM 12-03 Dup

Client Sample ID: **SWM 12-03 Dup**
 Client Project ID: **10227978 MOA StmWtr Outfall Mo**
 Lab Sample ID: 1204625028
 Lab Project ID: 1204625

Collection Date: 08/31/20 10:25
 Received Date: 08/31/20 13:29
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	4.22	1.00	0.310	ug/L	1		09/14/20 17:35

Batch Information

Analytical Batch: MMS10880
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/14/20 17:35
 Container ID: 1204625028-A

Prep Batch: MXX33607
 Prep Method: E200.2
 Prep Date/Time: 09/09/20 13:26
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Method Blank

Blank ID: MB for HBN 1811111 [BOD/6702]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1578442

QC for Samples:

1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011, 1204625012

Results by SM21 5210B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Biochemical Oxygen Demand	2.00U	2.00	2.00	mg/L

Batch Information

Analytical Batch: BOD6702

Analytical Method: SM21 5210B

Instrument:

Analyst: A.L

Analytical Date/Time: 9/1/2020 2:16:12PM

Print Date: 09/17/2020 12:24:54PM

Duplicate Sample Summary

Original Sample ID: 1204625011
Duplicate Sample ID: 1204625016
QC for Samples:

Analysis Date: 09/01/2020 14:16
Matrix: Water (Surface, Eff., Ground)

Results by SM21 5210B

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Biochemical Oxygen Demand	4.23	3.84	mg/L	9.70	

Batch Information

Analytical Batch: BOD6702
Analytical Method: SM21 5210B
Instrument:
Analyst: A.L

Print Date: 09/17/2020 12:24:55PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [BOD6702]

Blank Spike Lab ID: 1578443

Date Analyzed: 09/01/2020 14:16

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011, 1204625012

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	207	105	(84.6-115.4

Batch Information

Analytical Batch: **BOD6702**

Analytical Method: **SM21 5210B**

Instrument:

Analyst: **A.L**

Print Date: 09/17/2020 12:24:57PM



Method Blank

Blank ID: MB for HBN 1811080 [BTF/18355]
Blank Lab ID: 1578293

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204625001, 1204625002, 1204625003, 1204625010, 1204625011, 1204625012

Results by SM21 9222D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Instrument:
Analyst: M.A
Analytical Date/Time: 8/31/2020 4:25:00PM

Print Date: 09/17/2020 12:24:59PM



Method Blank

Blank ID: MB for HBN 1811080 [BTF/18355]
Blank Lab ID: 1578295

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011, 1204625012

Results by SM21 9222D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18355
Analytical Method: SM21 9222D
Instrument:
Analyst: A.A
Analytical Date/Time: 8/31/2020 6:12:00PM

Print Date: 09/17/2020 12:24:59PM

Duplicate Sample Summary

Original Sample ID: 1204625011
 Duplicate Sample ID: 1204625016
 QC for Samples:

Analysis Date: 08/31/2020 16:25
 Matrix: Water (Surface, Eff., Ground)

Results by SM21 9222D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Fecal Coliform	3800	2500	col/100mL	41.30	

Batch Information

Analytical Batch: BTF18355
 Analytical Method: SM21 9222D
 Instrument:
 Analyst: M.A

Print Date: 09/17/2020 12:25:00PM

Method Blank

Blank ID: MB for HBN 1811469 [MXX/33606]
 Blank Lab ID: 1580151

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009,
 1204625010, 1204625011, 1204625012, 1204625017, 1204625018, 1204625019, 1204625020, 1204625021, 1204625022,
 1204625024

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Calcium	250U	500	150	ug/L
Copper	0.500U	1.00	0.310	ug/L
Magnesium	25.0U	50.0	15.0	ug/L

Batch Information

Analytical Batch: MMS10884
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/16/2020 6:12:31PM

Prep Batch: MXX33606
 Prep Method: E200.2
 Prep Date/Time: 9/9/2020 12:13:52PM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [MXX33606]

Blank Spike Lab ID: 1580152

Date Analyzed: 09/16/2020 18:15

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011, 1204625012, 1204625017, 1204625018, 1204625019, 1204625020, 1204625021, 1204625022, 1204625024

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	10300	103	(85-115)
Copper	1000	1010	101	(85-115)
Magnesium	10000	10700	107	(85-115)

Batch Information

Analytical Batch: **MMS10884**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **DMM**

Prep Batch: **MXX33606**

Prep Method: **E200.2**

Prep Date/Time: **09/09/2020 12:13**

Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1204625024
 MS Sample ID: 1580155 MS
 MSD Sample ID:

Analysis Date: 09/16/2020 18:27
 Analysis Date: 09/16/2020 18:30
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625012, 1204625017, 1204625018, 1204625019, 1204625020, 1204625021, 1204625022, 1204625024

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	2.31	1000	1060	105				70-130		

Batch Information

Analytical Batch: MMS10884
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/16/2020 6:30:23PM

Prep Batch: MXX33606
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/9/2020 12:13:52PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Billable Matrix Spike Summary

Original Sample ID: 1204625011
 MS Sample ID: 1204625013 BMS
 MSD Sample ID: 1204625014 BMSD

Analysis Date: 09/16/2020 18:18
 Analysis Date: 09/16/2020 18:21
 Analysis Date: 09/16/2020 18:24
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Calcium	22900	10000	34900	120	10000	33000	101	70-130	5.50	(< 20)
Magnesium	5840	10000	17100	112	10000	16600	108	70-130	2.70	(< 20)

Batch Information

Analytical Batch: MMS10884
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 9/16/2020 6:21:28PM

Prep Batch: MXX33606
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/9/2020 12:13:52PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/17/2020 12:25:08PM

Method Blank

Blank ID: MB for HBN 1811474 [MXX/33607]
Blank Lab ID: 1580176

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204625025, 1204625026, 1204625027, 1204625028

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Copper	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: MMS10880
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 9/14/2020 5:17:57PM

Prep Batch: MXX33607
Prep Method: E200.2
Prep Date/Time: 9/9/2020 1:26:57PM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/17/2020 12:25:14PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [MXX33607]

Blank Spike Lab ID: 1580177

Date Analyzed: 09/14/2020 17:20

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625025, 1204625026, 1204625027, 1204625028

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Copper	1000	1050	105	(85-115)

Batch Information

Analytical Batch: **MMS10880**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **ACF**

Prep Batch: **MXX33607**

Prep Method: **E200.2**

Prep Date/Time: **09/09/2020 13:26**

Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/17/2020 12:25:16PM

Matrix Spike Summary

Original Sample ID: 1580181
 MS Sample ID: 1580182 MS
 MSD Sample ID:

Analysis Date: 09/14/2020 17:23
 Analysis Date: 09/14/2020 17:26
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625025, 1204625026, 1204625027, 1204625028

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	3.88	1000	1020	101				70-130		

Batch Information

Analytical Batch: MMS10880
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/14/2020 5:26:56PM

Prep Batch: MXX33607
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/9/2020 1:26:57PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/17/2020 12:25:18PM

Matrix Spike Summary

Original Sample ID: 1580183
 MS Sample ID: 1580184 MS
 MSD Sample ID:

Analysis Date: 09/14/2020 16:54
 Analysis Date: 09/14/2020 16:57
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625028

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	0.842J	1000	1030	103				70-130		

Batch Information

Analytical Batch: MMS10880
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/14/2020 4:57:36PM

Prep Batch: MXX33607
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/9/2020 1:26:57PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/17/2020 12:25:18PM

Billable Matrix Spike Summary

Original Sample ID: 1204625027
 MS Sample ID: 1204625029 BMS
 MSD Sample ID: 1204625030 BMSD

Analysis Date: 09/14/2020 17:23
 Analysis Date: 09/14/2020 17:26
 Analysis Date: 09/14/2020 17:29
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	3.88	1000	1020	101	1000	1050	105	70-130	3.60	(< 20)

Batch Information

Analytical Batch: MMS10880
 Analytical Method: EP200.8
 Instrument: Perkin Elmer NexIon P5
 Analyst: ACF
 Analytical Date/Time: 9/14/2020 5:26:56PM

Prep Batch: MXX33607
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/9/2020 1:26:57PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/17/2020 12:25:18PM

Method Blank

Blank ID: MB for HBN 1811503 [MXX/33608]

Blank Lab ID: 1580263

QC for Samples:

1204625023

Matrix: Water (Surface, Eff., Ground)

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Copper	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: MMS10880

Analytical Method: EP200.8

Instrument: Perkin Elmer Nexlon P5

Analyst: ACF

Analytical Date/Time: 9/14/2020 8:58:25PM

Prep Batch: MXX33608

Prep Method: E200.2

Prep Date/Time: 9/10/2020 11:51:11AM

Prep Initial Wt./Vol.: 20 mL

Prep Extract Vol: 50 mL

Print Date: 09/17/2020 12:25:19PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [MXX33608]
Blank Spike Lab ID: 1580264
Date Analyzed: 09/14/2020 21:01

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625023

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Copper	1000	1050	105	(85-115)

Batch Information

Analytical Batch: **MMS10880**
Analytical Method: **EP200.8**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **ACF**

Prep Batch: **MXX33608**
Prep Method: **E200.2**
Prep Date/Time: **09/10/2020 11:51**
Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 09/17/2020 12:25:22PM

Matrix Spike Summary

Original Sample ID: 1580266
 MS Sample ID: 1580267 MS
 MSD Sample ID:

Analysis Date: 09/14/2020 21:10
 Analysis Date: 09/14/2020 21:13
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625023

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	79.0	1000	1100	102				70-130		

Batch Information

Analytical Batch: MMS10880
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/14/2020 9:13:22PM

Prep Batch: MXX33608
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/10/2020 11:51:11AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/17/2020 12:25:24PM

Method Blank

Blank ID: MB for HBN 1811160 [STS/6781]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1578600

QC for Samples:

1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011, 1204625012

Results by SM21 2540D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Suspended Solids	0.500U	1.00	0.310	mg/L

Batch Information

Analytical Batch: STS6781

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Analytical Date/Time: 9/2/2020 1:18:36PM

Print Date: 09/17/2020 12:25:25PM

Duplicate Sample Summary

Original Sample ID: 1204564001

Duplicate Sample ID: 1578603

QC for Samples:

1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011

Analysis Date: 09/02/2020 13:18

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	1430	1592	mg/L	10.60*	(< 5)

Batch Information

Analytical Batch: STS6781

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/17/2020 12:25:27PM

Duplicate Sample Summary

Original Sample ID: 1204625011

Duplicate Sample ID: 1578604

QC for Samples:

1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007, 1204625008, 1204625009, 1204625010, 1204625011, 1204625012

Analysis Date: 09/02/2020 13:18

Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	76.0	76.0	mg/L	0.00	(< 5)

Batch Information

Analytical Batch: STS6781

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Print Date: 09/17/2020 12:25:27PM

Duplicate Sample Summary

Original Sample ID: 1204625011
Duplicate Sample ID: 1204625016
QC for Samples:

Analysis Date: 09/02/2020 13:18
Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	76.0	76.0	mg/L	0.00	(< 5)

Batch Information

Analytical Batch: STS6781
Analytical Method: SM21 2540D
Instrument:
Analyst: S.S

Print Date: 09/17/2020 12:25:27PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [STS6781]
 Blank Spike Lab ID: 1578601
 Date Analyzed: 09/02/2020 13:18

Spike Duplicate ID: LCSD for HBN 1204625
 [STS6781]
 Spike Duplicate Lab ID: 1578602
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625001, 1204625002, 1204625003, 1204625004, 1204625005, 1204625006, 1204625007,
 1204625008, 1204625009, 1204625010, 1204625011, 1204625012

Results by SM21 2540D

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Total Suspended Solids	25	24.8	99	25	24.6	98	(75-125)	0.81	(< 5)

Batch Information

Analytical Batch: STS6781
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Print Date: 09/17/2020 12:25:28PM

Method Blank

Blank ID: MB for HBN 1811101 [VXX/36252]
 Blank Lab ID: 1578379

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1204625003, 1204625005, 1204625008, 1204625011, 1204625012, 1204625015

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	111	85-114		%
Toluene-d8 (surr)	105	89-112		%

Batch Information

Analytical Batch: VMS20267
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 8/31/2020 4:20:00PM

Prep Batch: VXX36252
 Prep Method: SW5030B
 Prep Date/Time: 8/31/2020 4:00:00PM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [VXX36252]
 Blank Spike Lab ID: 1578380
 Date Analyzed: 08/31/2020 16:39

Spike Duplicate ID: LCSD for HBN 1204625 [VXX36252]
 Spike Duplicate Lab ID: 1578381
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625003, 1204625005, 1204625008, 1204625011, 1204625012, 1204625015

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	32.3	108	30	31.2	104	(79-120)	3.30	(< 20)
Ethylbenzene	30	33.6	112	30	33.7	112	(79-121)	0.45	(< 20)
o-Xylene	30	33.8	113	30	33.6	112	(78-122)	0.53	(< 20)
P & M -Xylene	60	66.9	111	60	66.4	111	(80-121)	0.73	(< 20)
Toluene	30	31.4	105	30	31.2	104	(80-121)	0.38	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98.5	99	30	99.4	99	(81-118)	0.94	
4-Bromofluorobenzene (surr)	30	106	106	30	104	104	(85-114)	2.40	
Toluene-d8 (surr)	30	101	101	30	101	101	(89-112)	0.03	

Batch Information

Analytical Batch: **VMS20267**
 Analytical Method: **EPA 602/624**
 Instrument: **Agilent 7890-75MS**
 Analyst: **NRB**

Prep Batch: **VXX36252**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/31/2020 16:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL



Billable Matrix Spike Summary

Original Sample ID: 1204625011
MS Sample ID: 1204625013 BMS
MSD Sample ID: 1204625014 BMSD

Analysis Date: 08/31/2020 21:37
Analysis Date: 08/31/2020 17:42
Analysis Date: 08/31/2020 17:57
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	32	107	30.0	30.9	103	79-120	3.70	(< 20)
Ethylbenzene	0.500U	30.0	33.1	110	30.0	33.2	111	79-121	0.26	(< 20)
o-Xylene	0.500U	30.0	33.1	110	30.0	33.2	111	78-122	0.36	(< 20)
P & M -Xylene	1.00U	60.0	66.3	111	60.0	66.0	110	80-121	0.47	(< 20)
Toluene	0.500U	30.0	31.1	104	30.0	30.9	103	80-121	0.82	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	30.3	101	30.0	29.7	99	81-118	2.10	
4-Bromofluorobenzene (surr)		30.0	32	107	30.0	31.9	106	85-114	0.16	
Toluene-d8 (surr)		30.0	30.2	101	30.0	30.1	100	89-112	0.37	

Batch Information

Analytical Batch: VMS20267
Analytical Method: EPA 602/624
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 8/31/2020 5:42:00PM

Prep Batch: VXX36252
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 8/31/2020 4:00:00PM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 09/17/2020 12:25:35PM



Method Blank

Blank ID: MB for HBN 1811212 [XXX/43792]
Blank Lab ID: 1578886

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204625003, 1204625005, 1204625008, 1204625011, 1204625012

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	56.6	37-78		%
Fluoranthene-d10 (surr)	74.7	24-116		%

Batch Information

Analytical Batch: XMS12256
Analytical Method: EPA 625M SIM (PAH) LV
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 9/9/2020 11:31:00PM

Prep Batch: XXX43792
Prep Method: SW3535A
Prep Date/Time: 9/3/2020 9:22:19AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/17/2020 12:25:37PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204625 [XXX43792]
 Blank Spike Lab ID: 1578887
 Date Analyzed: 09/09/2020 23:51

Spike Duplicate ID: LCSD for HBN 1204625
 [XXX43792]
 Spike Duplicate Lab ID: 1578888
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625003, 1204625005, 1204625008, 1204625011, 1204625012

Results by EPA 625M SIM (PAH) LV

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	2	1.34	67	2	1.39	69	(48-114)	3.20	(< 20)
Acenaphthylene	2	1.52	76	2	1.55	77	(35-121)	1.80	(< 20)
Anthracene	2	1.49	74	2	1.54	77	(53-119)	3.30	(< 20)
Benzo(a)Anthracene	2	1.36	68	2	1.34	67	(59-120)	1.20	(< 20)
Benzo[a]pyrene	2	1.69	85	2	1.69	84	(53-120)	0.12	(< 20)
Benzo[b]Fluoranthene	2	1.68	84	2	1.60	80	(53-126)	4.70	(< 20)
Benzo[g,h,i]perylene	2	1.73	87	2	1.73	87	(44-128)	0.06	(< 20)
Benzo[k]fluoranthene	2	1.64	82	2	1.66	83	(54-125)	1.20	(< 20)
Chrysene	2	1.61	81	2	1.58	79	(57-120)	2.00	(< 20)
Dibenzo[a,h]anthracene	2	1.76	88	2	1.75	88	(44-131)	0.34	(< 20)
Fluoranthene	2	1.49	75	2	1.52	76	(58-120)	1.80	(< 20)
Fluorene	2	1.49	75	2	1.54	77	(50-118)	2.70	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.86	93	2	1.86	93	(48-130)	0.28	(< 20)
Naphthalene	2	1.32	66	2	1.35	68	(43-114)	2.30	(< 20)
Phenanthrene	2	1.47	74	2	1.52	76	(53-115)	3.30	(< 20)
Pyrene	2	1.47	74	2	1.48	74	(53-121)	0.71	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	62.5	63	2	64.6	65	(37-78)	3.30	
Fluoranthene-d10 (surr)	2	76.5	77	2	78	78	(24-116)	1.90	

Batch Information

Analytical Batch: XMS12256
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD

Prep Batch: XXX43792
 Prep Method: SW3535A
 Prep Date/Time: 09/03/2020 09:22
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Matrix Spike Summary

Original Sample ID: 1204625012
 MS Sample ID: 1578889 MS
 MSD Sample ID: 1578890 MSD

Analysis Date: 09/10/2020 0:53
 Analysis Date: 09/10/2020 1:13
 Analysis Date: 09/10/2020 1:33
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204625003, 1204625005, 1204625008, 1204625011, 1204625012

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0245U	1.96	1.36	70	1.92	1.24	65	48-114	9.40	(< 20)
Acenaphthylene	0.0245U	1.96	1.5	77	1.92	1.37	71	35-121	8.90	(< 20)
Anthracene	0.0245U	1.96	1.55	79	1.92	1.35	70	53-119	13.70	(< 20)
Benzo(a)Anthracene	0.0245U	1.96	1.39	71	1.92	1.20	63	59-120	14.40	(< 20)
Benzo[a]pyrene	0.00980U	1.96	1.64	84	1.92	1.43	75	53-120	13.30	(< 20)
Benzo[b]Fluoranthene	0.0245U	1.96	1.64	84	1.92	1.42	74	53-126	14.70	(< 20)
Benzo[g,h,i]perylene	0.0245U	1.96	1.54	79	1.92	1.37	71	44-128	11.90	(< 20)
Benzo[k]fluoranthene	0.0245U	1.96	1.55	79	1.92	1.37	71	54-125	12.30	(< 20)
Chrysene	0.0245U	1.96	1.64	84	1.92	1.40	73	57-120	16.30	(< 20)
Dibenzo[a,h]anthracene	0.00980U	1.96	1.56	80	1.92	1.40	73	44-131	11.20	(< 20)
Fluoranthene	0.0651	1.96	1.65	81	1.92	1.40	70	58-120	15.90	(< 20)
Fluorene	0.0245U	1.96	1.53	78	1.92	1.36	71	50-118	12.00	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0245U	1.96	1.65	84	1.92	1.47	77	48-130	11.50	(< 20)
Naphthalene	0.0490U	1.96	1.39	71	1.92	1.32	69	43-114	5.20	(< 20)
Phenanthrene	0.0614	1.96	1.56	76	1.92	1.38	68	53-115	12.40	(< 20)
Pyrene	0.0785	1.96	1.62	78	1.92	1.38	68	53-121	15.90	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.96	1.36	69	1.92	1.23	64	37-78	9.60	
Fluoranthene-d10 (surr)		1.96	1.64	83	1.92	1.37	71	24-116	17.90	

Batch Information

Analytical Batch: XMS12256
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 9/10/2020 1:13:00AM

Prep Batch: XXX43792
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/3/2020 9:22:19AM
 Prep Initial Wt./Vol.: 255.00mL
 Prep Extract Vol: 1.00mL



Billable Matrix Spike Summary

Original Sample ID: 1204625011
 MS Sample ID: 1204625013 BMS
 MSD Sample ID: 1204625014 BMSD

Analysis Date: 09/08/2020 15:57
 Analysis Date: 09/10/2020 1:13
 Analysis Date: 09/10/2020 1:33
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0261U	1.96	1.36	70	1.92	1.24	65	48-114	9.40	(< 20)
Acenaphthylene	0.0261U	1.96	1.5	77	1.92	1.37	71	35-121	8.90	(< 20)
Anthracene	0.0261U	1.96	1.55	79	1.92	1.35	70	53-119	13.70	(< 20)
Benzo(a)Anthracene	0.0261U	1.96	1.39	71	1.92	1.20	63	59-120	14.40	(< 20)
Benzo[a]pyrene	0.0104U	1.96	1.64	84	1.92	1.43	75	53-120	13.30	(< 20)
Benzo[b]Fluoranthene	0.0261U	1.96	1.64	84	1.92	1.42	74	53-126	14.70	(< 20)
Benzo[g,h,i]perylene	0.0261U	1.96	1.54	79	1.92	1.37	71	44-128	11.90	(< 20)
Benzo[k]fluoranthene	0.0261U	1.96	1.55	79	1.92	1.37	71	54-125	12.30	(< 20)
Chrysene	0.0261U	1.96	1.64	84	1.92	1.40	73	57-120	16.30	(< 20)
Dibenzo[a,h]anthracene	0.0104U	1.96	1.56	80	1.92	1.40	73	44-131	11.20	(< 20)
Fluoranthene	0.0742	1.96	1.65	80	1.92	1.40	69	58-120	15.90	(< 20)
Fluorene	0.0261U	1.96	1.53	78	1.92	1.36	71	50-118	12.00	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0261U	1.96	1.65	84	1.92	1.47	77	48-130	11.50	(< 20)
Naphthalene	0.0520U	1.96	1.39	71	1.92	1.32	69	43-114	5.20	(< 20)
Phenanthrene	0.0648	1.96	1.56	76	1.92	1.38	68	53-115	12.40	(< 20)
Pyrene	0.0871	1.96	1.62	78	1.92	1.38	67	53-121	15.90	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.96	1.36	69	1.92	1.23	64	37-78	9.60	
Fluoranthene-d10 (surr)		1.96	1.64	83	1.92	1.37	71	24-116	17.90	

Batch Information

Analytical Batch: XMS12256
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 9/10/2020 1:13:00AM

Prep Batch: XXX43792
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/3/2020 9:22:19AM
 Prep Initial Wt./Vol.: 255.00mL
 Prep Extract Vol: 1.00mL

Print Date: 09/17/2020 12:25:41PM



SGS North America Inc.
CHAIN OF CUSTODY RECORD

1204625



www.us.sgs.com

Section 1	CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>1</u> of <u>2</u>							
	CONTACT: Cindy Helmericks					PHONE #: 907-644-2017					Section 3		Preservative										
	PROJECT NAME: MOA Stormwater Outfall Monitoring					PROJECT/ PWSID/ PERMIT#: 10227978					CONTAINER #	Comp Grab MI (Multi-incremental)	Analysis*										NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS
	REPORTS TO: Cindy Helmericks					E-MAIL: cindy.helmericks@hdrinc.com							None										
INVOICE TO: MOA HDR Inc. KAC					QUOTE #: P.O. #: 358860					None													
Section 2	RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	CONTAINER #	Comp Grab MI (Multi-incremental)	5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)	REMARKS/LOC ID								
	(1AD)	SWM 03-03	08/31/20	9:55	WS			5	G	✓	✓			✓	✓	✓	(17AB)						
	(2AD)	SWM 04-03		10:00	WS			5	G	✓	✓			✓	✓	✓	(18AB)						
	(3AD)	SWM 05-03		11:00	WS			10	G	✓	✓	✓	✓	✓	✓	✓	(19AB)						
	(4AD)	SWM 06-03		11:30	WS			5	G	✓	✓			✓	✓	✓	(20AB)						
	(5AD)	SWM 07-03		11:45	WS			5	G	✓	✓			✓	✓	✓	(21AB)						
	(6AD)	SWM 08-03		12:00	WS			10	G	✓	✓	✓	✓	✓	✓	✓	(22AB)						
	(7AD)	SWM 08-03 Dup		12:05	WS			10	G	✓	✓	✓	✓	✓	✓	✓	(23AB)						
	(8AD)	SWM 09-03		12:35	WS				G	✓	✓	✓	✓	✓	✓	✓	(24AB)						
	(9AD)	SWM 10-03		12:50	WS				G	✓	✓			✓	✓	✓	(25AB)						
	(10AD)	SWM 11-03		9:10	WS				G	✓	✓			✓	✓	✓	(26AB)						
Section 5	Relinquished By: (1) <i>Kay Helmericks</i>			Date 08/31/20	Time 13:35	Received By:			Section 4		DOD Project? Yes (No)		Data Deliverable Requirements:										
	Relinquished By: (2)			Date	Time	Received By:			Cooler ID:														
	Relinquished By: (3)			Date	Time	Received By:			Requested Turnaround Time and/or Special Instructions:														
	Relinquished By: (4)			Date 8/31/20	Time 13:29	Received For Laboratory By: <i>Chloe Cullen KAC</i>			Temp Blank °C: 1) 2.4 D58 2) 2.7 D50 3) 2.1 D45 4) 2.6 D30 5) 2.0 D59		Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)		Delivery Method: Hand Delivery [X] Commercial Delivery []										

<http://www.sgs.com/terms-and-conditions>



1204625



SGS North America Inc. CHAIN OF CUSTODY RECORD

www.us.sgs.com

Section 1	CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>2</u> of <u>2</u>			
	CONTACT: Cindy Helmericks PHONE #: 907-644-2017					Section 3					Preservative								
	PROJECT NAME: MOA Stormwater Outfall Monitoring PROJECT/PWSID/PERMIT#: 10227978					CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis*										NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS	
	REPORTS TO: Cindy Helmericks E-MAIL: cindy.helmericks@hdrinc.com Profile #: 358860							None HCl Na2SO4											
INVOICE TO: MOA HDR Inc. KRG QUOTE #: P.O. #:																			
Section 2	RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	#	MI	5210B - BOD	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	9222D - Fecal Coliform	200.8 - Dissolved Cu (Lab Filter)	REMARKS/LOC ID				
	(11AI)	SWM 12-03	08/31/20	10:20	WS	10	G	✓	✓	✓	✓	✓	✓	✓	(27 AB)				
	(12AI)	SWM 12-03 Dup	↓	10:25	WS	10	G	✓	✓	✓	✓	✓	✓	✓	(26 16A) (25 AB)				
	(13-14AF)	SWM 12-03	↓	10:30	WS	15	G	✓	✓	✓	✓	✓	✓	✓	MS/MSD (27-30 AB)				
	(15AC)	SWM TripBlank-03	↓	9:16	WS	3	G			✓					Trip Blanks (3)				
Section 5	Relinquished By: (1)			Date	Time	Received By:			Section 4		DOD Project? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Data Deliverable Requirements:						
	Relinquished By: (2)			Date	Time	Received By:			Cooler ID:		Requested Turnaround Time and/or Special Instructions:								
	Relinquished By: (3)			Date	Time	Received By:			Temp Blank °C:		Chain of Custody Seal: (Circle)								
	Relinquished By: (4)			Date	Time	Received For Laboratory By:			1) 2.4 D58 2) 2.7 D50 3) 2.1 D45 4) 2.6 D30 5) 2.0 D59 or Ambient []		INTACT BROKEN <input checked="" type="checkbox"/> ABSENT								
Delivery Method: Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery []																			

http://www.sgs.com/terms-and-conditions



e-Sample Receipt Form

SGS Workorder #:

1204625



1 2 0 4 6 2 5

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.4 °C Therm. ID: D58
	Yes	Cooler ID: 2 @ 2.7 °C Therm. ID: D50
	Yes	Cooler ID: 3 @ 2.1 °C Therm. ID: D45
	Yes	Cooler ID: 4 @ 2.6 °C Therm. ID: D30
	Yes	Cooler ID: 5 @ 2.0 °C Therm. ID: D59
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	No	No number of containers on COC for samples 8-10. Proceeded.
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g, 200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		
Samples 5 has additional contains with analyses :TAH & TAqH. Proceeded to schedule. Samples 6-7 missing containers for TAH & TAqH. Proceeded to not schedule.		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204625001-A	Na2S2O3 for Chlorine Redu	OK	1204625009-D	HNO3 to pH < 2	OK
1204625001-B	No Preservative Required	OK	1204625010-A	Na2S2O3 for Chlorine Redu	OK
1204625001-C	No Preservative Required	OK	1204625010-B	No Preservative Required	OK
1204625001-D	HNO3 to pH < 2	OK	1204625010-C	No Preservative Required	OK
1204625002-A	Na2S2O3 for Chlorine Redu	OK	1204625010-D	HNO3 to pH < 2	OK
1204625002-B	No Preservative Required	OK	1204625011-A	Na2S2O3 for Chlorine Redu	OK
1204625002-C	No Preservative Required	OK	1204625011-B	No Preservative Required	OK
1204625002-D	HNO3 to pH < 2	OK	1204625011-C	No Preservative Required	OK
1204625003-A	Na2S2O3 for Chlorine Redu	OK	1204625011-D	HNO3 to pH < 2	OK
1204625003-B	No Preservative Required	OK	1204625011-E	No Preservative Required	OK
1204625003-C	No Preservative Required	OK	1204625011-F	No Preservative Required	OK
1204625003-D	HNO3 to pH < 2	OK	1204625011-G	HCL to pH < 2	OK
1204625003-E	No Preservative Required	OK	1204625011-H	HCL to pH < 2	OK
1204625003-F	No Preservative Required	OK	1204625011-I	HCL to pH < 2	OK
1204625003-G	HCL to pH < 2	OK	1204625012-A	Na2S2O3 for Chlorine Redu	OK
1204625003-H	HCL to pH < 2	OK	1204625012-B	No Preservative Required	OK
1204625003-I	HCL to pH < 2	OK	1204625012-C	No Preservative Required	OK
1204625004-A	Na2S2O3 for Chlorine Redu	OK	1204625012-D	HNO3 to pH < 2	OK
1204625004-B	No Preservative Required	OK	1204625012-E	No Preservative Required	OK
1204625004-C	No Preservative Required	OK	1204625012-F	No Preservative Required	OK
1204625004-D	HNO3 to pH < 2	OK	1204625012-G	HCL to pH < 2	OK
1204625005-A	Na2S2O3 for Chlorine Redu	OK	1204625012-H	HCL to pH < 2	OK
1204625005-B	No Preservative Required	OK	1204625012-I	HCL to pH < 2	OK
1204625005-C	No Preservative Required	OK	1204625013-A	HNO3 to pH < 2	OK
1204625005-D	HNO3 to pH < 2	OK	1204625013-B	No Preservative Required	OK
1204625005-E	No Preservative Required	OK	1204625013-C	No Preservative Required	OK
1204625005-F	No Preservative Required	OK	1204625013-D	HCL to pH < 2	OK
1204625005-G	HCL to pH < 2	OK	1204625013-E	HCL to pH < 2	OK
1204625005-H	HCL to pH < 2	OK	1204625013-F	HCL to pH < 2	OK
1204625005-I	HCL to pH < 2	OK	1204625014-A	HNO3 to pH < 2	OK
1204625006-A	Na2S2O3 for Chlorine Redu	OK	1204625014-B	No Preservative Required	OK
1204625006-B	No Preservative Required	OK	1204625014-C	No Preservative Required	OK
1204625006-C	No Preservative Required	OK	1204625014-D	HCL to pH < 2	OK
1204625006-D	HNO3 to pH < 2	OK	1204625014-E	HCL to pH < 2	OK
1204625007-A	Na2S2O3 for Chlorine Redu	OK	1204625014-F	HCL to pH < 2	OK
1204625007-B	No Preservative Required	OK	1204625015-A	HCL to pH < 2	OK
1204625007-C	No Preservative Required	OK	1204625015-B	HCL to pH < 2	OK
1204625007-D	HNO3 to pH < 2	OK	1204625015-C	HCL to pH < 2	OK
1204625008-A	Na2S2O3 for Chlorine Redu	OK	1204625016-A	No Preservative Required	OK
1204625008-B	No Preservative Required	OK	1204625016-B	No Preservative Required	OK
1204625008-C	No Preservative Required	OK	1204625016-C	No Preservative Required	OK
1204625008-D	HNO3 to pH < 2	OK	1204625017-A	No Preservative Required	OK
1204625008-E	No Preservative Required	OK	1204625017-B	HNO3 to pH < 2	OK
1204625008-F	No Preservative Required	OK	1204625018-A	No Preservative Required	OK
1204625008-G	HCL to pH < 2	OK	1204625018-B	HNO3 to pH < 2	OK
1204625008-H	HCL to pH < 2	OK	1204625019-A	No Preservative Required	OK
1204625008-I	HCL to pH < 2	OK	1204625019-B	HNO3 to pH < 2	OK
1204625009-A	Na2S2O3 for Chlorine Redu	OK	1204625020-A	No Preservative Required	OK
1204625009-B	No Preservative Required	OK	1204625020-B	HNO3 to pH < 2	OK
1204625009-C	No Preservative Required	OK	1204625021-A	No Preservative Required	OK

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204625021-B	HNO3 to pH < 2	OK			
1204625022-A	No Preservative Required	OK			
1204625022-B	HNO3 to pH < 2	OK			
1204625023-A	No Preservative Required	OK			
1204625023-B	HNO3 to pH < 2	OK			
1204625024-A	No Preservative Required	OK			
1204625024-B	HNO3 to pH < 2	OK			
1204625025-A	No Preservative Required	OK			
1204625025-B	HNO3 to pH < 2	OK			
1204625026-A	No Preservative Required	OK			
1204625026-B	HNO3 to pH < 2	OK			
1204625027-A	No Preservative Required	OK			
1204625027-B	HNO3 to pH < 2	OK			
1204625028-A	No Preservative Required	OK			
1204625028-B	HNO3 to pH < 2	OK			
1204625029-A	No Preservative Required	OK			
1204625029-B	HNO3 to pH < 2	OK			
1204625030-A	No Preservative Required	OK			
1204625030-B	HNO3 to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

Appendix C4
Laboratory Data Package
Storm Event #4

Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
 2525 C Street, #500
 Anchorage, AK 99503
 (907)644-2017

Report Number: **1205053**

Client Project: **102279787 MOA S.O.M**

Dear Cynthia Helmericks,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
 SGS North America Inc.

Justin Nelson
 Project Manager
 Justin.Nelson@sgs.com

Date

Revised Report - This report has been revised to correct the 200.8 compound list.

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1205053**
Project Name/Site: **102279787 MOA S.O.M**
Project Contact: **Cynthia Helmericks**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 10/12/2020 2:34:22PM

Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
EPA 625M SIM (PAH) LV				
1205053008	SWM 09-04	XMS12294	Benzo[k]fluoranthene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 10/12/2020 2:34:23PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
SWM 03-04	1205053001	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 04-04	1205053002	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 05-04	1205053003	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 06-04	1205053004	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 07-04	1205053005	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 08-04	1205053006	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 08-04 Dup	1205053007	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 09-04	1205053008	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 10-04	1205053009	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 11-04	1205053010	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04	1205053011	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04 Dup	1205053012	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04 MS	1205053013	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04 MSD	1205053014	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM TripBlank-04	1205053015	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04	1205053016	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 03-04	1205053017	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 04-04	1205053018	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 05-04	1205053019	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 06-04	1205053020	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 07-04	1205053021	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 08-04	1205053022	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 08-04 Dup	1205053023	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 09-04	1205053024	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 10-04	1205053025	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 11-04	1205053026	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04	1205053027	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04 Dup	1205053028	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04 MS	1205053029	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)
SWM 12-04 MSD	1205053030	09/17/2020	09/17/2020	Water (Surface, Eff., Ground)

Print Date: 10/12/2020 2:34:26PM

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
<u>Method</u>	<u>Method Description</u>			
EPA 602/624	602 Aromatics by 624 (W)			
EPA 625M SIM (PAH) LV	625 PAH SIM GC/MS Low Volume			
SM21 5210B	Biochemical Oxygen Demand SM21 5210B			
SM21 9222D	Fecal Coliform (MF)			
SM21 2340B	Hardness as CaCO ₃ by ICP-MS			
EP200.8	Metals in Drinking Water by ICP-MS DISSO			
EP200.8	Metals in Water by 200.8 ICP-MS			
SM21 2540D	Total Suspended Solids SM20 2540D			

Print Date: 10/12/2020 2:34:26PM

Detectable Results Summary

 Client Sample ID: **SWM 03-04**

Lab Sample ID: 1205053001

Metals by ICP/MS
Microbiology Laboratory
Waters Department

 Client Sample ID: **SWM 04-04**

Lab Sample ID: 1205053002

Metals by ICP/MS
Microbiology Laboratory
Waters Department

 Client Sample ID: **SWM 05-04**

Lab Sample ID: 1205053003

Metals by ICP/MS
Microbiology Laboratory
Waters Department

 Client Sample ID: **SWM 06-04**

Lab Sample ID: 1205053004

Metals by ICP/MS
Microbiology Laboratory
Waters Department

 Client Sample ID: **SWM 07-04**

Lab Sample ID: 1205053005

Metals by ICP/MS
Microbiology Laboratory
Polynuclear Aromatics GC/MS
Waters Department

 Client Sample ID: **SWM 08-04**

Lab Sample ID: 1205053006

Metals by ICP/MS
Microbiology Laboratory
Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	6230	ug/L
Hardness as CaCO ₃	61.7	mg/L
Biochemical Oxygen Demand	2.09	mg/L
Fecal Coliform	220	col/100mL
Total Suspended Solids	7.96	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	8190	ug/L
Hardness as CaCO ₃	74.9	mg/L
Fecal Coliform	673	col/100mL
Total Suspended Solids	7.75	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	8520	ug/L
Biochemical Oxygen Demand	3.31	mg/L
Fecal Coliform	1140	col/100mL
Total Suspended Solids	26.6	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	3870J	ug/L
Biochemical Oxygen Demand	3.67	mg/L
Fecal Coliform	470	col/100mL
Total Suspended Solids	29.0	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	5050	ug/L
Biochemical Oxygen Demand	5.55	mg/L
Fecal Coliform	1050	col/100mL
Benzo[g,h,i]perylene	0.114	ug/L
Chrysene	0.0630	ug/L
Fluoranthene	0.150	ug/L
Phenanthrene	0.119	ug/L
Pyrene	0.191	ug/L
Total Suspended Solids	165	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	3910J	ug/L
Biochemical Oxygen Demand	4.47	mg/L
Fecal Coliform	2100	col/100mL
Total Suspended Solids	59.0	mg/L

Print Date: 10/12/2020 2:34:28PM

SGS North America Inc.

 200 West Potter Drive, Anchorage, AK 99518
 t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Detectable Results Summary

 Client Sample ID: **SWM 08-04 Dup**

Lab Sample ID: 1205053007

Metals by ICP/MS
Microbiology Laboratory
Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	3540J	ug/L
Biochemical Oxygen Demand	4.40	mg/L
Fecal Coliform	2000	col/100mL
Total Suspended Solids	58.3	mg/L

 Client Sample ID: **SWM 09-04**

Lab Sample ID: 1205053008

Metals by ICP/MS
Microbiology Laboratory
Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	4390J	ug/L
Biochemical Oxygen Demand	3.81	mg/L
Fecal Coliform	791	col/100mL
Benzo(a)Anthracene	0.337	ug/L
Benzo[a]pyrene	0.438	ug/L
Benzo[b]Fluoranthene	0.844	ug/L
Benzo[g,h,i]perylene	0.472	ug/L
Benzo[k]fluoranthene	0.246	ug/L
Chrysene	0.635	ug/L
Dibenzo[a,h]anthracene	0.0960	ug/L
Fluoranthene	0.910	ug/L
Indeno[1,2,3-c,d] pyrene	0.411	ug/L
Phenanthrene	0.293	ug/L
Pyrene	0.737	ug/L
Toluene	0.320J	ug/L
Total Suspended Solids	91.7	mg/L

Volatile GC/MS
Waters Department

 Client Sample ID: **SWM 10-04**

Lab Sample ID: 1205053009

Metals by ICP/MS
Microbiology Laboratory
Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	10600	ug/L
Biochemical Oxygen Demand	5.18	mg/L
Fecal Coliform	450	col/100mL
Total Suspended Solids	268	mg/L

 Client Sample ID: **SWM 11-04**

Lab Sample ID: 1205053010

Metals by ICP/MS
Microbiology Laboratory
Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	5210	ug/L
Biochemical Oxygen Demand	4.17	mg/L
Fecal Coliform	636	col/100mL
Total Suspended Solids	39.3	mg/L

Detectable Results Summary

 Client Sample ID: **SWM 12-04**

Lab Sample ID: 1205053011

Metals by ICP/MS
Microbiology Laboratory
Polynuclear Aromatics GC/MS
Waters Department

 Client Sample ID: **SWM 12-04 Dup**

Lab Sample ID: 1205053012

Metals by ICP/MS
Microbiology Laboratory
Polynuclear Aromatics GC/MS
Waters Department

 Client Sample ID: **SWM 03-04**

Lab Sample ID: 1205053017

Dissolved Metals by ICP/MS

 Client Sample ID: **SWM 04-04**

Lab Sample ID: 1205053018

Dissolved Metals by ICP/MS

 Client Sample ID: **SWM 05-04**

Lab Sample ID: 1205053019

Dissolved Metals by ICP/MS

 Client Sample ID: **SWM 06-04**

Lab Sample ID: 1205053020

Dissolved Metals by ICP/MS

 Client Sample ID: **SWM 07-04**

Lab Sample ID: 1205053021

Dissolved Metals by ICP/MS

 Client Sample ID: **SWM 08-04**

Lab Sample ID: 1205053022

Dissolved Metals by ICP/MS

 Client Sample ID: **SWM 08-04 Dup**

Lab Sample ID: 1205053023

Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	18100	ug/L
Hardness as CaCO ₃	63.4	mg/L
Biochemical Oxygen Demand	5.77	mg/L
Fecal Coliform	2300	col/100mL
Fluoranthene	0.0589	ug/L
Phenanthrene	0.0576	ug/L
Pyrene	0.0789	ug/L
Total Suspended Solids	89.0	mg/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	18600	ug/L
Hardness as CaCO ₃	65.2	mg/L
Biochemical Oxygen Demand	7.14	mg/L
Fecal Coliform	1110	col/100mL
Fluoranthene	0.0674	ug/L
Naphthalene	0.0467J	ug/L
Phenanthrene	0.0907	ug/L
Pyrene	0.0897	ug/L
Total Suspended Solids	88.5	mg/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.37	ug/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.41	ug/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.70	ug/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	1.25	ug/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.06	ug/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.45	ug/L
<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.24	ug/L

Print Date: 10/12/2020 2:34:28PM

Detectable Results Summary

Client Sample ID: SWM 09-04			
Lab Sample ID: 1205053024	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	1.18	ug/L
Client Sample ID: SWM 10-04			
Lab Sample ID: 1205053025	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	1.21	ug/L
Client Sample ID: SWM 11-04			
Lab Sample ID: 1205053026	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	2.58	ug/L
Client Sample ID: SWM 12-04			
Lab Sample ID: 1205053027	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	4.11	ug/L
Client Sample ID: SWM 12-04 Dup			
Lab Sample ID: 1205053028	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	4.03	ug/L

Print Date: 10/12/2020 2:34:28PM

SGS North America Inc.

 200 West Potter Drive, Anchorage, AK 99518
 t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Results of SWM 03-04

Client Sample ID: **SWM 03-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053001
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:50
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	6230	200	60.0	ug/L	1		10/01/20 17:47

Batch Information

Analytical Batch: MMS10902	Prep Batch: MX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 17:47	Prep Initial Wt./Vol.: 1 mL
Container ID:	Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	61.7	5.00	5.00	mg/L	1		10/01/20 17:47

Batch Information

Analytical Batch: MMS10902	Prep Batch: MX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 17:47	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053001-B	Prep Extract Vol: 50 mL

Results of SWM 03-04

Client Sample ID: **SWM 03-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053001
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:50
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.09		2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053001-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	220		10.0	10.0	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053001-A

Results of SWM 03-04

Client Sample ID: **SWM 03-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053001
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:50
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	7.96		0.971	0.301	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053001-D

Results of SWM 04-04

Client Sample ID: **SWM 04-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053002
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	8190	200	60.0	ug/L	1		10/01/20 18:02

Batch Information

Analytical Batch: MMS10902	Prep Batch: MX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:02	Prep Initial Wt./Vol.: 1 mL
Container ID:	Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	74.9	5.00	5.00	mg/L	1		10/01/20 18:02

Batch Information

Analytical Batch: MMS10902	Prep Batch: MX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:02	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053002-B	Prep Extract Vol: 50 mL

Results of SWM 04-04

Client Sample ID: **SWM 04-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053002
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	2.00 U	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053002-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	673	9.09	9.09	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053002-A

Results of SWM 04-04

Client Sample ID: **SWM 04-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053002
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	7.75		0.980	0.304	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053002-D

Results of SWM 05-04

Client Sample ID: **SWM 05-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053003
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:05
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	8520	5000	1500	ug/L	10		10/01/20 18:08

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:08	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053003-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:08

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:08	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053003-B	Prep Extract Vol: 50 mL

Results of SWM 05-04

Client Sample ID: **SWM 05-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053003
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:05
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.31		2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053003-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1140		9.09	9.09	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053003-A

Results of SWM 05-04

Client Sample ID: **SWM 05-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053003
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:05
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Acenaphthylene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Anthracene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Benzo(a)Anthracene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Benzo[a]pyrene	0.00980 U	0.0196	0.00608	ug/L	1		09/24/20 14:46
Benzo[b]Fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Benzo[g,h,i]perylene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Benzo[k]fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Chrysene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Dibenzo[a,h]anthracene	0.00980 U	0.0196	0.00608	ug/L	1		09/24/20 14:46
Fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Fluorene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Indeno[1,2,3-c,d] pyrene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Naphthalene	0.0490 U	0.0980	0.0304	ug/L	1		09/24/20 14:46
Phenanthrene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Pyrene	0.0245 U	0.0490	0.0147	ug/L	1		09/24/20 14:46
Surrogates							
2-Methylnaphthalene-d10 (surr)	64.5	37-78		%	1		09/24/20 14:46
Fluoranthene-d10 (surr)	75.7	24-116		%	1		09/24/20 14:46

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 09/24/20 14:46
 Container ID: 1205053003-E

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 09/23/20 10:15
 Prep Initial Wt./Vol.: 255 mL
 Prep Extract Vol: 1 mL

Results of SWM 05-04

Client Sample ID: **SWM 05-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053003
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:05
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/20/20 00:26
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:26
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:26
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/20/20 00:26
Toluene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:26
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/20/20 00:26
4-Bromofluorobenzene (surr)	95.9	85-114		%	1		09/20/20 00:26
Toluene-d8 (surr)	98.7	89-112		%	1		09/20/20 00:26

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/20/20 00:26
 Container ID: 1205053003-G

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 09/19/20 21:30
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 05-04

Client Sample ID: **SWM 05-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053003
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:05
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	26.6		2.00	0.620	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053003-D

Results of SWM 06-04

Client Sample ID: **SWM 06-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053004
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:40
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	3870 J	5000	1500	ug/L	10		10/01/20 18:11

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:11	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053004-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:11

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:11	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053004-B	Prep Extract Vol: 50 mL

Results of SWM 06-04

Client Sample ID: **SWM 06-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053004
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:40
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.67	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053004-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	470	10.0	10.0	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053004-A

Results of SWM 06-04

Client Sample ID: **SWM 06-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053004
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:40
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	29.0		2.00	0.620	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053004-D

Results of SWM 07-04

Client Sample ID: **SWM 07-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053005
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:00
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	5050	5000	1500	ug/L	10		10/01/20 18:14

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:14	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053005-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:14

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:14	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053005-B	Prep Extract Vol: 50 mL

Results of SWM 07-04

Client Sample ID: **SWM 07-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053005
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:00
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	5.55	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053005-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1050	9.09	9.09	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053005-A

Results of SWM 07-04

Client Sample ID: **SWM 07-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053005
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:00
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		09/24/20 15:06
Benzo[b]Fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Benzo[g,h,i]perylene	0.114	0.0472	0.0142	ug/L	1		09/24/20 15:06
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Chrysene	0.0630	0.0472	0.0142	ug/L	1		09/24/20 15:06
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		09/24/20 15:06
Fluoranthene	0.150	0.0472	0.0142	ug/L	1		09/24/20 15:06
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Indeno[1,2,3-c,d] pyrene	0.0236 U	0.0472	0.0142	ug/L	1		09/24/20 15:06
Naphthalene	0.0471 U	0.0943	0.0292	ug/L	1		09/24/20 15:06
Phenanthrene	0.119	0.0472	0.0142	ug/L	1		09/24/20 15:06
Pyrene	0.191	0.0472	0.0142	ug/L	1		09/24/20 15:06
Surrogates							
2-Methylnaphthalene-d10 (surr)	69.7	37-78		%	1		09/24/20 15:06
Fluoranthene-d10 (surr)	77.2	24-116		%	1		09/24/20 15:06

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 09/24/20 15:06
 Container ID: 1205053005-E

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 09/23/20 10:15
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

Results of SWM 07-04

Client Sample ID: **SWM 07-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053005
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:00
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/20/20 00:40
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:40
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:40
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/20/20 00:40
Toluene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:40
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/20/20 00:40
4-Bromofluorobenzene (surr)	95.2	85-114		%	1		09/20/20 00:40
Toluene-d8 (surr)	99.9	89-112		%	1		09/20/20 00:40

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/20/20 00:40
 Container ID: 1205053005-G

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 09/19/20 21:30
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 07-04

Client Sample ID: **SWM 07-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053005
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:00
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	165		5.00	1.55	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053005-D

Results of SWM 08-04

Client Sample ID: **SWM 08-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053006
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	3910 J	5000	1500	ug/L	10		10/01/20 18:17

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:17	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053006-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:17

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:17	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053006-B	Prep Extract Vol: 50 mL

Results of SWM 08-04

Client Sample ID: **SWM 08-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053006
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.47	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053006-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2100	100	100	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053006-A

Results of SWM 08-04

Client Sample ID: **SWM 08-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053006
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	59.0		3.33	1.03	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053006-D

Results of SWM 08-04 Dup

Client Sample ID: **SWM 08-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053007
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	3540 J	5000	1500	ug/L	10		10/01/20 18:20

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:20	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053007-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:20

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:20	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053007-B	Prep Extract Vol: 50 mL

Results of SWM 08-04 Dup

Client Sample ID: **SWM 08-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053007
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.40		2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053007-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2000		100	100	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053007-A

Results of SWM 08-04 Dup

Client Sample ID: **SWM 08-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053007
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	58.3		2.86	0.886	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053007-D

Results of SWM 09-04

Client Sample ID: **SWM 09-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053008
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:45
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	4390 J	5000	1500	ug/L	10		10/01/20 18:23

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:23	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053008-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:23

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:23	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053008-B	Prep Extract Vol: 50 mL

Results of SWM 09-04

Client Sample ID: **SWM 09-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053008
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:45
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	3.81	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053008-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	791	9.09	9.09	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053008-A

Results of SWM 09-04

Client Sample ID: **SWM 09-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053008
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:45
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 15:27
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 15:27
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 15:27
Benzo(a)Anthracene	0.337	0.0481	0.0144	ug/L	1		09/24/20 15:27
Benzo[a]pyrene	0.438	0.0192	0.00596	ug/L	1		09/24/20 15:27
Benzo[b]Fluoranthene	0.844	0.0481	0.0144	ug/L	1		09/24/20 15:27
Benzo[g,h,i]perylene	0.472	0.0481	0.0144	ug/L	1		09/24/20 15:27
Benzo[k]fluoranthene	0.246	0.0481	0.0144	ug/L	1		09/24/20 15:27
Chrysene	0.635	0.0481	0.0144	ug/L	1		09/24/20 15:27
Dibenzo[a,h]anthracene	0.0960	0.0192	0.00596	ug/L	1		09/24/20 15:27
Fluoranthene	0.910	0.0481	0.0144	ug/L	1		09/24/20 15:27
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 15:27
Indeno[1,2,3-c,d] pyrene	0.411	0.0481	0.0144	ug/L	1		09/24/20 15:27
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		09/24/20 15:27
Phenanthrene	0.293	0.0481	0.0144	ug/L	1		09/24/20 15:27
Pyrene	0.737	0.0481	0.0144	ug/L	1		09/24/20 15:27
Surrogates							
2-Methylnaphthalene-d10 (surr)	64.9	37-78		%	1		09/24/20 15:27
Fluoranthene-d10 (surr)	73.7	24-116		%	1		09/24/20 15:27

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 09/24/20 15:27
 Container ID: 1205053008-E

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 09/23/20 10:15
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of SWM 09-04

Client Sample ID: **SWM 09-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053008
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:45
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/20/20 00:55
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:55
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/20/20 00:55
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/20/20 00:55
Toluene	0.320 J	1.00	0.310	ug/L	1		09/20/20 00:55
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/20/20 00:55
4-Bromofluorobenzene (surr)	99.5	85-114		%	1		09/20/20 00:55
Toluene-d8 (surr)	99.5	89-112		%	1		09/20/20 00:55

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/20/20 00:55
 Container ID: 1205053008-G

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 09/19/20 21:30
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 09-04

Client Sample ID: **SWM 09-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053008
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:45
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	91.7		3.33	1.03	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053008-D

Results of SWM 10-04

Client Sample ID: **SWM 10-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053009
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	10600	5000	1500	ug/L	10		10/01/20 18:26

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:26	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053009-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:26

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:26	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053009-B	Prep Extract Vol: 50 mL

Results of SWM 10-04

Client Sample ID: **SWM 10-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053009
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	5.18	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053009-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	450	10.0	10.0	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053009-A

Results of SWM 10-04

Client Sample ID: **SWM 10-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053009
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Total Suspended Solids	268		4.00	1.24	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053009-D

Results of SWM 11-04

Client Sample ID: **SWM 11-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053010
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	5210	5000	1500	ug/L	10		10/01/20 18:29

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:29	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053010-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	50.0 U	50.0	50.0	mg/L	10		10/01/20 18:29

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:29	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053010-B	Prep Extract Vol: 50 mL

Results of SWM 11-04

Client Sample ID: **SWM 11-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053010
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	4.17	2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053010-C

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	636	9.09	9.09	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053010-A

Results of SWM 11-04

Client Sample ID: **SWM 11-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053010
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	39.3		3.33	1.03	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053010-D

Results of SWM 12-04

Client Sample ID: **SWM 12-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053011
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Calcium	18100		5000	1500	ug/L	10		10/01/20 17:32

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 17:32	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053011-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	63.4		50.0	50.0	mg/L	10		10/01/20 17:32

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 17:32	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053011-B	Prep Extract Vol: 50 mL

Results of SWM 12-04

Client Sample ID: **SWM 12-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053011
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	5.77		2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053011-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	2300		100	100	col/100mL	1		09/17/20 16:09

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:09
 Container ID: 1205053011-A

Results of SWM 12-04

Client Sample ID: **SWM 12-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053011
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Acenaphthylene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Benzo(a)Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Benzo[a]pyrene	0.00925 U	0.0185	0.00574	ug/L	1		09/24/20 15:47
Benzo[b]Fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Benzo[g,h,i]perylene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Benzo[k]fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Chrysene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Dibenzo[a,h]anthracene	0.00925 U	0.0185	0.00574	ug/L	1		09/24/20 15:47
Fluoranthene	0.0589	0.0463	0.0139	ug/L	1		09/24/20 15:47
Fluorene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Indeno[1,2,3-c,d] pyrene	0.0232 U	0.0463	0.0139	ug/L	1		09/24/20 15:47
Naphthalene	0.0463 U	0.0926	0.0287	ug/L	1		09/24/20 15:47
Phenanthrene	0.0576	0.0463	0.0139	ug/L	1		09/24/20 15:47
Pyrene	0.0789	0.0463	0.0139	ug/L	1		09/24/20 15:47
Surrogates							
2-Methylnaphthalene-d10 (surr)	61	37-78		%	1		09/24/20 15:47
Fluoranthene-d10 (surr)	71.9	24-116		%	1		09/24/20 15:47

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 09/24/20 15:47
 Container ID: 1205053011-E

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 09/23/20 10:15
 Prep Initial Wt./Vol.: 270 mL
 Prep Extract Vol: 1 mL

Results of SWM 12-04

Client Sample ID: **SWM 12-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053011
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/20/20 01:10
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/20/20 01:10
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/20/20 01:10
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/20/20 01:10
Toluene	0.500 U	1.00	0.310	ug/L	1		09/20/20 01:10
Surrogates							
1,2-Dichloroethane-D4 (surr)	106	81-118		%	1		09/20/20 01:10
4-Bromofluorobenzene (surr)	96.7	85-114		%	1		09/20/20 01:10
Toluene-d8 (surr)	99.5	89-112		%	1		09/20/20 01:10

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/20/20 01:10
 Container ID: 1205053011-G

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 09/19/20 21:30
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 12-04

Client Sample ID: **SWM 12-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053011
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	89.0		5.00	1.55	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053011-D

Results of SWM 12-04 Dup

Client Sample ID: **SWM 12-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053012
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:20
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Calcium	18600	5000	1500	ug/L	10		10/01/20 18:38

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:38	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053012-B	Prep Extract Vol: 50 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Hardness as CaCO3	65.2	50.0	50.0	mg/L	10		10/01/20 18:38

Batch Information

Analytical Batch: MMS10902	Prep Batch: MXX33663
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: ACF	Prep Date/Time: 09/24/20 12:39
Analytical Date/Time: 10/01/20 18:38	Prep Initial Wt./Vol.: 20 mL
Container ID: 1205053012-B	Prep Extract Vol: 50 mL

Results of SWM 12-04 Dup

Client Sample ID: **SWM 12-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053012
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:20
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Microbiology Laboratory

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Biochemical Oxygen Demand	7.14		2.00	2.00	mg/L	1		09/18/20 12:04

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Analyst: A.L
 Analytical Date/Time: 09/18/20 12:04
 Container ID: 1205053012-C

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Fecal Coliform	1110		9.09	9.09	col/100mL	1		09/17/20 16:28

Batch Information

Analytical Batch: BTF18389
 Analytical Method: SM21 9222D
 Analyst: A.L
 Analytical Date/Time: 09/17/20 16:28
 Container ID: 1205053012-A

Results of SWM 12-04 Dup

Client Sample ID: **SWM 12-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053012
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:20
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		09/24/20 16:08
Benzo[b]Fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Benzo[g,h,i]perylene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Chrysene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		09/24/20 16:08
Fluoranthene	0.0674	0.0481	0.0144	ug/L	1		09/24/20 16:08
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Indeno[1,2,3-c,d] pyrene	0.0240 U	0.0481	0.0144	ug/L	1		09/24/20 16:08
Naphthalene	0.0467 J	0.0962	0.0298	ug/L	1		09/24/20 16:08
Phenanthrene	0.0907	0.0481	0.0144	ug/L	1		09/24/20 16:08
Pyrene	0.0897	0.0481	0.0144	ug/L	1		09/24/20 16:08
Surrogates							
2-Methylnaphthalene-d10 (surr)	65.1	37-78		%	1		09/24/20 16:08
Fluoranthene-d10 (surr)	74.5	24-116		%	1		09/24/20 16:08

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: DSD
 Analytical Date/Time: 09/24/20 16:08
 Container ID: 1205053012-E

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 09/23/20 10:15
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of SWM 12-04 Dup

Client Sample ID: **SWM 12-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053012
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:20
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/20/20 01:24
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/20/20 01:24
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/20/20 01:24
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/20/20 01:24
Toluene	0.500 U	1.00	0.310	ug/L	1		09/20/20 01:24
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/20/20 01:24
4-Bromofluorobenzene (surr)	96	85-114		%	1		09/20/20 01:24
Toluene-d8 (surr)	99.7	89-112		%	1		09/20/20 01:24

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/20/20 01:24
 Container ID: 1205053012-G

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 09/19/20 21:30
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 12-04 Dup

Client Sample ID: **SWM 12-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053012
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:20
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Waters Department

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Suspended Solids	88.5		5.00	1.55	mg/L	1		09/18/20 12:13

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Analyst: S.S
 Analytical Date/Time: 09/18/20 12:13
 Container ID: 1205053012-D

Results of SWM TripBlank-04

Client Sample ID: **SWM TripBlank-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053015
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/19/20 23:42
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/19/20 23:42
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/19/20 23:42
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/19/20 23:42
Toluene	0.500 U	1.00	0.310	ug/L	1		09/19/20 23:42
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	81-118		%	1		09/19/20 23:42
4-Bromofluorobenzene (surr)	96.4	85-114		%	1		09/19/20 23:42
Toluene-d8 (surr)	99	89-112		%	1		09/19/20 23:42

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/19/20 23:42
 Container ID: 1205053015-A

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 09/19/20 21:30
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of SWM 03-04

Client Sample ID: **SWM 03-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053017
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:50
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.37		1.00	0.310	ug/L	1		10/01/20 18:41

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:41
 Container ID: 1205053017-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 04-04

Client Sample ID: **SWM 04-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053018
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.41		1.00	0.310	ug/L	1		10/01/20 18:44

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:44
 Container ID: 1205053018-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 05-04

Client Sample ID: **SWM 05-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053019
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:05
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.70		1.00	0.310	ug/L	1		10/01/20 18:47

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:47
 Container ID: 1205053019-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 06-04

Client Sample ID: **SWM 06-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053020
 Lab Project ID: 1205053

Collection Date: 09/17/20 11:40
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.25		1.00	0.310	ug/L	1		10/01/20 18:50

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:50
 Container ID: 1205053020-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 07-04

Client Sample ID: **SWM 07-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053021
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:00
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	4.06		1.00	0.310	ug/L	1		10/01/20 18:53

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:53
 Container ID: 1205053021-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 08-04

Client Sample ID: **SWM 08-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053022
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.45		1.00	0.310	ug/L	1		10/01/20 18:56

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:56
 Container ID: 1205053022-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 08-04 Dup

Client Sample ID: **SWM 08-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053023
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.24		1.00	0.310	ug/L	1		10/01/20 18:59

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 18:59
 Container ID: 1205053023-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 09-04

Client Sample ID: **SWM 09-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053024
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:45
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.18		1.00	0.310	ug/L	1		10/01/20 17:41

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 10/01/20 17:41
 Container ID: 1205053024-A

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 10-04

Client Sample ID: **SWM 10-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053025
 Lab Project ID: 1205053

Collection Date: 09/17/20 12:55
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	1.21		1.00	0.310	ug/L	1		09/28/20 21:41

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/28/20 21:41
 Container ID: 1205053025-A

Prep Batch: MXX33664
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 11-04

Client Sample ID: **SWM 11-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053026
 Lab Project ID: 1205053

Collection Date: 09/17/20 09:10
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Copper	2.58		1.00	0.310	ug/L	1		09/28/20 21:44

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/28/20 21:44
 Container ID: 1205053026-A

Prep Batch: MX33664
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 12-04

Client Sample ID: **SWM 12-04**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053027
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:15
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	4.11		1.00	0.310	ug/L	1		09/28/20 21:53

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/28/20 21:53
 Container ID: 1205053027-A

Prep Batch: MXX33664
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM 12-04 Dup

Client Sample ID: **SWM 12-04 Dup**
 Client Project ID: **102279787 MOA S.O.M**
 Lab Sample ID: 1205053028
 Lab Project ID: 1205053

Collection Date: 09/17/20 10:20
 Received Date: 09/17/20 14:10
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Dissolved Metals by ICP/MS

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Copper	4.03		1.00	0.310	ug/L	1		09/28/20 21:26

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/28/20 21:26
 Container ID: 1205053028-A

Prep Batch: MXX33664
 Prep Method: E200.2
 Prep Date/Time: 09/24/20 12:39
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Method Blank

Blank ID: MB for HBN 1811876 [BOD/6719]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1582004

QC for Samples:

1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012

Results by SM21 5210B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Biochemical Oxygen Demand	2.00U	2.00	2.00	mg/L

Batch Information

Analytical Batch: BOD6719

Analytical Method: SM21 5210B

Instrument:

Analyst: A.L

Analytical Date/Time: 9/18/2020 12:04:32PM

Print Date: 10/12/2020 2:34:34PM

Duplicate Sample Summary

Original Sample ID: 1205053011
 Duplicate Sample ID: 1205053016
 QC for Samples:

Analysis Date: 09/18/2020 12:04
 Matrix: Water (Surface, Eff., Ground)

Results by SM21 5210B

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Biochemical Oxygen Demand	5.77	5.08	mg/L	12.70	

Batch Information

Analytical Batch: BOD6719
 Analytical Method: SM21 5210B
 Instrument:
 Analyst: A.L

Print Date: 10/12/2020 2:34:35PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205053 [BOD6719]

Blank Spike Lab ID: 1582005

Date Analyzed: 09/18/2020 12:04

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	195	99	(84.6-115.4

Batch Information

Analytical Batch: **BOD6719**
 Analytical Method: **SM21 5210B**
 Instrument:
 Analyst: **A.L**

Print Date: 10/12/2020 2:34:37PM

Method Blank

Blank ID: MB for HBN 1811847 [BTF/18389]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1581873

QC for Samples:

1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012

Results by SM21 9222D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Fecal Coliform	1.00U	1.00	1.00	col/100mL

Batch Information

Analytical Batch: BTF18389

Analytical Method: SM21 9222D

Instrument:

Analyst: A.L

Analytical Date/Time: 9/17/2020 4:09:00PM

Print Date: 10/12/2020 2:34:40PM

Duplicate Sample Summary

Original Sample ID: 1205053011
Duplicate Sample ID: 1205053016
QC for Samples:

Analysis Date: 09/17/2020 16:28
Matrix: Water (Surface, Eff., Ground)

Results by SM21 9222D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Fecal Coliform	2300	955	col/100mL	82.70	

Batch Information

Analytical Batch: BTF18389
Analytical Method: SM21 9222D
Instrument:
Analyst: A.L

Print Date: 10/12/2020 2:34:41PM

Method Blank

Blank ID: MB for HBN 1812126 [MXX/33663]
 Blank Lab ID: 1583377

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012, 1205053017, 1205053018, 1205053019, 1205053020, 1205053021, 1205053022, 1205053023, 1205053024

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Calcium	250U	500	150	ug/L
Copper	0.351J	1.00	0.310	ug/L

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 10/1/2020 5:26:29PM

Prep Batch: MXX33663
 Prep Method: E200.2
 Prep Date/Time: 9/24/2020 12:39:59PM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 10/12/2020 2:34:44PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205053 [MXX33663]
 Blank Spike Lab ID: 1583378
 Date Analyzed: 10/01/2020 17:29

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007,
 1205053008, 1205053009, 1205053010, 1205053011, 1205053012, 1205053017, 1205053018,
 1205053019, 1205053020, 1205053021, 1205053022, 1205053023, 1205053024

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	10700	107	(85-115)
Copper	1000	1040	104	(85-115)

Batch Information

Analytical Batch: **MMS10902**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **ACF**

Prep Batch: **MXX33663**
 Prep Method: **E200.2**
 Prep Date/Time: **09/24/2020 12:39**
 Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/12/2020 2:34:47PM

Matrix Spike Summary

Original Sample ID: 1205053024
 MS Sample ID: 1583380 MS
 MSD Sample ID:

Analysis Date: 10/01/2020 17:41
 Analysis Date: 10/01/2020 17:44
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012, 1205053017, 1205053018, 1205053019, 1205053020, 1205053021, 1205053022, 1205053023, 1205053024

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	1.18	1000	1030	103				70-130		

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 10/1/2020 5:44:27PM

Prep Batch: MXX33663
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/24/2020 12:39:59PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 10/12/2020 2:34:48PM

Billable Matrix Spike Summary

Original Sample ID: 1205053011
 MS Sample ID: 1205053013 BMS
 MSD Sample ID: 1205053014 BMSD

Analysis Date: 10/01/2020 17:32
 Analysis Date: 10/01/2020 17:35
 Analysis Date: 10/01/2020 17:38
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Calcium	18100	10000	30100	120	10000	29400	113	70-130	2.20	(< 20)

Batch Information

Analytical Batch: MMS10902
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 10/1/2020 5:35:28PM

Prep Batch: MXX33663
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/24/2020 12:39:59PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 10/12/2020 2:34:48PM

Method Blank

Blank ID: MB for HBN 1812127 [MXX/33664]
Blank Lab ID: 1583381

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1205053025, 1205053026, 1205053027, 1205053028

Results by EP200.8

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Copper	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: MMS10899
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 9/28/2020 9:20:38PM

Prep Batch: MXX33664
Prep Method: E200.2
Prep Date/Time: 9/24/2020 12:39:57PM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/12/2020 2:34:54PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205053 [MXX33664]
 Blank Spike Lab ID: 1583382
 Date Analyzed: 09/28/2020 21:23

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053025, 1205053026, 1205053027, 1205053028

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Copper	1000	1030	103	(85-115)

Batch Information

Analytical Batch: **MMS10899**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **ACF**

Prep Batch: **MXX33664**
 Prep Method: **E200.2**
 Prep Date/Time: **09/24/2020 12:39**
 Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/12/2020 2:34:56PM

Matrix Spike Summary

Original Sample ID: 1583384
 MS Sample ID: 1583385 MS
 MSD Sample ID:

Analysis Date: 09/28/2020 21:26
 Analysis Date: 09/28/2020 21:29
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053025, 1205053026, 1205053027, 1205053028

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	4.03	1000	1000	100				70-130		

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/28/2020 9:29:37PM

Prep Batch: MXX33664
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/24/2020 12:39:57PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 10/12/2020 2:34:58PM

Matrix Spike Summary

Original Sample ID: 1583387
 MS Sample ID: 1583388 MS
 MSD Sample ID:

Analysis Date: 09/28/2020 21:35
 Analysis Date: 09/28/2020 21:38
 Analysis Date:
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	33.2	1000	1050	102				70-130		

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/28/2020 9:38:36PM

Prep Batch: MXX33664
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/24/2020 12:39:57PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 10/12/2020 2:34:58PM

Billable Matrix Spike Summary

Original Sample ID: 1205053027
 MS Sample ID: 1205053029 BMS
 MSD Sample ID: 1205053030 BMSD

Analysis Date: 09/28/2020 21:53
 Analysis Date: 09/28/2020 21:29
 Analysis Date: 09/28/2020 21:32
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EP200.8

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Copper	4.11	1000	1000	100	1000	1020	101	70-130	1.40	(< 20)

Batch Information

Analytical Batch: MMS10899
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/28/2020 9:29:37PM

Prep Batch: MXX33664
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/24/2020 12:39:57PM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 10/12/2020 2:34:58PM

Method Blank

Blank ID: MB for HBN 1811864 [STS/6793]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1581958

QC for Samples:

1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012

Results by SM21 2540D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Suspended Solids	0.500U	1.00	0.310	mg/L

Batch Information

Analytical Batch: STS6793

Analytical Method: SM21 2540D

Instrument:

Analyst: S.S

Analytical Date/Time: 9/18/2020 12:13:43PM

Print Date: 10/12/2020 2:35:00PM

Duplicate Sample Summary

Original Sample ID: 1204959002
 Duplicate Sample ID: 1581961

Analysis Date: 09/18/2020 12:13
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008,
 1205053009, 1205053010, 1205053011

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	28.7	29.3	mg/L	2.30	(< 5)

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Print Date: 10/12/2020 2:35:01PM

Duplicate Sample Summary

Original Sample ID: 1205053011
 Duplicate Sample ID: 1581962

Analysis Date: 09/18/2020 12:13
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008,
 1205053009, 1205053010, 1205053011, 1205053012

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	89.0	88.5	mg/L	0.56	(< 5)

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Print Date: 10/12/2020 2:35:01PM

Duplicate Sample Summary

Original Sample ID: 1205053011
 Duplicate Sample ID: 1205053016
 QC for Samples:

Analysis Date: 09/18/2020 12:13
 Matrix: Water (Surface, Eff., Ground)

Results by SM21 2540D

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Suspended Solids	89.0	88.5	mg/L	0.56	(< 5)

Batch Information

Analytical Batch: STS6793
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: S.S

Print Date: 10/12/2020 2:35:01PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205053 [STS6793]
 Blank Spike Lab ID: 1581959
 Date Analyzed: 09/18/2020 12:13

Spike Duplicate ID: LCSD for HBN 1205053 [STS6793]
 Spike Duplicate Lab ID: 1581960
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053001, 1205053002, 1205053003, 1205053004, 1205053005, 1205053006, 1205053007, 1205053008, 1205053009, 1205053010, 1205053011, 1205053012

Results by SM21 2540D

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Total Suspended Solids	25	24.0	96	25	24.4	98	(75-125)	1.70	(< 5)

Batch Information

Analytical Batch: **STS6793**
 Analytical Method: **SM21 2540D**
 Instrument:
 Analyst: **S.S**

Print Date: 10/12/2020 2:35:02PM

Method Blank

Blank ID: MB for HBN 1811933 [VXX/36379]
 Blank Lab ID: 1582288

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1205053003, 1205053005, 1205053008, 1205053011, 1205053012, 1205053015

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	97.4	85-114		%
Toluene-d8 (surr)	103	89-112		%

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 9/19/2020 9:45:00PM

Prep Batch: VXX36379
 Prep Method: SW5030B
 Prep Date/Time: 9/19/2020 9:30:00PM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 10/12/2020 2:35:04PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205053 [VXX36379]
 Blank Spike Lab ID: 1582289
 Date Analyzed: 09/19/2020 21:59

Spike Duplicate ID: LCSD for HBN 1205053 [VXX36379]
 Spike Duplicate Lab ID: 1582290
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053003, 1205053005, 1205053008, 1205053011, 1205053012, 1205053015

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	29.4	98	30	29.2	97	(79-120)	0.95	(< 20)
Ethylbenzene	30	30.8	103	30	31.0	103	(79-121)	0.70	(< 20)
o-Xylene	30	31.8	106	30	31.9	106	(78-122)	0.33	(< 20)
P & M -Xylene	60	64.9	108	60	65.0	108	(80-121)	0.14	(< 20)
Toluene	30	28.5	95	30	31.8	106	(80-121)	11.00	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	101	101	30	93.9	94	(81-118)	7.50	
4-Bromofluorobenzene (surr)	30	97	97	30	96.9	97	(85-114)	0.10	
Toluene-d8 (surr)	30	99.5	100	30	111	111	(89-112)	10.90	

Batch Information

Analytical Batch: **VMS20333**
 Analytical Method: **EPA 602/624**
 Instrument: **Agilent 7890-75MS**
 Analyst: **NRB**

Prep Batch: **VXX36379**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/19/2020 21:30**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 10/12/2020 2:35:06PM

Billable Matrix Spike Summary

Original Sample ID: 1205053011
 MS Sample ID: 1205053013 BMS
 MSD Sample ID: 1205053014 BMSD

Analysis Date: 09/20/2020 1:10
 Analysis Date: 09/19/2020 22:29
 Analysis Date: 09/19/2020 22:43
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	30.8	103	30.0	29.4	98	79-120	4.50	(< 20)
Ethylbenzene	0.500U	30.0	31.5	105	30.0	32.1	107	79-121	1.80	(< 20)
o-Xylene	0.500U	30.0	33.5	112	30.0	32.8	109	78-122	2.30	(< 20)
P & M -Xylene	1.00U	60.0	67.8	113	60.0	66.2	110	80-121	2.40	(< 20)
Toluene	0.500U	30.0	27.7	93	30.0	29.3	98	80-121	5.40	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.8	99	30.0	30.0	100	81-118	0.86	
4-Bromofluorobenzene (surr)		30.0	30	100	30.0	28.9	96	85-114	3.70	
Toluene-d8 (surr)		30.0	27.8	93	30.0	30.2	101	89-112	8.20	

Batch Information

Analytical Batch: VMS20333
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 9/19/2020 10:29:00PM

Prep Batch: VXX36379
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 9/19/2020 9:30:00PM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Method Blank

Blank ID: MB for HBN 1812038 [XXX/43920]
 Blank Lab ID: 1582872

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1205053003, 1205053005, 1205053008, 1205053011, 1205053012

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	60.4	37-78		%
Fluoranthene-d10 (surr)	73.5	24-116		%

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 9/24/2020 1:24:00PM

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 9/23/2020 10:15:07AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1205053 [XXX43920]
 Blank Spike Lab ID: 1582873
 Date Analyzed: 09/24/2020 13:45

Spike Duplicate ID: LCSD for HBN 1205053 [XXX43920]
 Spike Duplicate Lab ID: 1582874
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053003, 1205053005, 1205053008, 1205053011, 1205053012

Results by EPA 625M SIM (PAH) LV

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	2	1.40	70	2	1.42	71	(48-114)	1.70	(< 20)
Acenaphthylene	2	1.50	75	2	1.53	76	(35-121)	2.10	(< 20)
Anthracene	2	1.55	78	2	1.50	75	(53-119)	3.30	(< 20)
Benzo(a)Anthracene	2	1.55	77	2	1.46	73	(59-120)	5.30	(< 20)
Benzo[a]pyrene	2	1.82	91	2	1.74	87	(53-120)	4.40	(< 20)
Benzo[b]Fluoranthene	2	1.75	87	2	1.66	83	(53-126)	5.20	(< 20)
Benzo[g,h,i]perylene	2	1.84	92	2	1.78	89	(44-128)	3.70	(< 20)
Benzo[k]fluoranthene	2	1.73	87	2	1.65	83	(54-125)	4.50	(< 20)
Chrysene	2	1.64	82	2	1.58	79	(57-120)	3.90	(< 20)
Dibenzo[a,h]anthracene	2	1.93	96	2	1.86	93	(44-131)	3.40	(< 20)
Fluoranthene	2	1.55	78	2	1.48	74	(58-120)	5.10	(< 20)
Fluorene	2	1.53	77	2	1.52	76	(50-118)	0.62	(< 20)
Indeno[1,2,3-c,d] pyrene	2	2.04	102	2	1.95	97	(48-130)	4.70	(< 20)
Naphthalene	2	1.38	69	2	1.40	70	(43-114)	2.10	(< 20)
Phenanthrene	2	1.63	81	2	1.59	80	(53-115)	2.30	(< 20)
Pyrene	2	1.52	76	2	1.45	72	(53-121)	4.90	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	60.8	61	2	62.5	63	(37-78)	2.70	
Fluoranthene-d10 (surr)	2	73.6	74	2	73.3	73	(24-116)	0.33	

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD

Prep Batch: XXX43920
 Prep Method: SW3535A
 Prep Date/Time: 09/23/2020 10:15
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Matrix Spike Summary

Original Sample ID: 1205053012
 MS Sample ID: 1582875 MS
 MSD Sample ID: 1582876 MSD

Analysis Date: 09/24/2020 16:08
 Analysis Date: 09/24/2020 16:28
 Analysis Date: 09/24/2020 16:49
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1205053003, 1205053005, 1205053008, 1205053011, 1205053012

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0240U	1.92	1.28	66	1.92	1.38	72	48-114	7.50	(< 20)
Acenaphthylene	0.0240U	1.92	1.36	71	1.92	1.45	76	35-121	6.50	(< 20)
Anthracene	0.0240U	1.92	1.36	71	1.92	1.38	72	53-119	1.20	(< 20)
Benzo(a)Anthracene	0.0240U	1.92	1.37	71	1.92	1.31	68	59-120	4.80	(< 20)
Benzo[a]pyrene	0.00960U	1.92	1.51	79	1.92	1.47	77	53-120	2.50	(< 20)
Benzo[b]Fluoranthene	0.0240U	1.92	1.5	78	1.92	1.46	76	53-126	2.90	(< 20)
Benzo[g,h,i]perylene	0.0240U	1.92	1.38	72	1.92	1.35	70	44-128	2.50	(< 20)
Benzo[k]fluoranthene	0.0240U	1.92	1.42	74	1.92	1.35	71	54-125	5.00	(< 20)
Chrysene	0.0240U	1.92	1.47	76	1.92	1.39	72	57-120	5.50	(< 20)
Dibenzo[a,h]anthracene	0.00960U	1.92	1.47	77	1.92	1.44	75	44-131	2.60	(< 20)
Fluoranthene	0.0674	1.92	1.47	73	1.92	1.39	69	58-120	5.50	(< 20)
Fluorene	0.0240U	1.92	1.36	71	1.92	1.43	75	50-118	5.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0240U	1.92	1.54	80	1.92	1.51	79	48-130	2.00	(< 20)
Naphthalene	0.0467J	1.92	1.39	70	1.92	1.45	73	43-114	3.90	(< 20)
Phenanthrene	0.0907	1.92	1.46	71	1.92	1.51	74	53-115	3.50	(< 20)
Pyrene	0.0897	1.92	1.45	71	1.92	1.39	68	53-121	4.40	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	1.18	61	1.92	1.29	67	37-78	8.80	
Fluoranthene-d10 (surr)		1.92	1.38	72	1.92	1.34	70	24-116	3.20	

Batch Information

Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 9/24/2020 4:28:00PM

Prep Batch: XXX43920
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/23/2020 10:15:07AM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 10/12/2020 2:35:14PM

Billable Matrix Spike Summary

Original Sample ID: 1205053011
 MS Sample ID: 1205053013 BMS
 MSD Sample ID: 1205053014 BMSD

Analysis Date: 09/24/2020 15:47
 Analysis Date: 09/24/2020 16:28
 Analysis Date: 09/24/2020 16:49
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0232U	1.92	1.28	66	1.92	1.38	72	48-114	7.50	(< 20)
Acenaphthylene	0.0232U	1.92	1.36	71	1.92	1.45	76	35-121	6.50	(< 20)
Anthracene	0.0232U	1.92	1.36	71	1.92	1.38	72	53-119	1.20	(< 20)
Benzo(a)Anthracene	0.0232U	1.92	1.37	71	1.92	1.31	68	59-120	4.80	(< 20)
Benzo[a]pyrene	0.00925U	1.92	1.51	79	1.92	1.47	77	53-120	2.50	(< 20)
Benzo[b]Fluoranthene	0.0232U	1.92	1.5	78	1.92	1.46	76	53-126	2.90	(< 20)
Benzo[g,h,i]perylene	0.0232U	1.92	1.38	72	1.92	1.35	70	44-128	2.50	(< 20)
Benzo[k]fluoranthene	0.0232U	1.92	1.42	74	1.92	1.35	71	54-125	5.00	(< 20)
Chrysene	0.0232U	1.92	1.47	76	1.92	1.39	72	57-120	5.50	(< 20)
Dibenzo[a,h]anthracene	0.00925U	1.92	1.47	77	1.92	1.44	75	44-131	2.60	(< 20)
Fluoranthene	0.0589	1.92	1.47	74	1.92	1.39	69	58-120	5.50	(< 20)
Fluorene	0.0232U	1.92	1.36	71	1.92	1.43	75	50-118	5.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0232U	1.92	1.54	80	1.92	1.51	79	48-130	2.00	(< 20)
Naphthalene	0.0463U	1.92	1.39	73	1.92	1.45	75	43-114	3.90	(< 20)
Phenanthrene	0.0576	1.92	1.46	73	1.92	1.51	76	53-115	3.50	(< 20)
Pyrene	0.0789	1.92	1.45	72	1.92	1.39	68	53-121	4.40	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	1.18	61	1.92	1.29	67	37-78	8.80	
Fluoranthene-d10 (surr)		1.92	1.38	72	1.92	1.34	70	24-116	3.20	

Batch Information

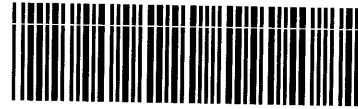
Analytical Batch: XMS12294
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 9/24/2020 4:28:00PM

Prep Batch: XXX43920
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/23/2020 10:15:07AM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 10/12/2020 2:35:14PM



SGS North America Inc.
CHAIN OF CUSTODY RECORD



1205053

www.us.sgs.com

CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>1</u> of <u>2</u>												
CONTACT: Cindy Helmericks PHONE #: 907-644-2017					Section 3		Preservative																				
PROJECT NAME: MOA Stormwater Outfall Monitoring					PROJECT/ PWSID/ PERMIT#: 10227978		None HCl Na2SO4																				
REPORTS TO: Cindy Helmericks					E-MAIL: cindy.helmericks@hdrinc.com		Analysis*										NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS										
INVOICE TO: MOA HDR Inc. 1226					QUOTE #: P.O. #:		5210B - BOD EPA 200.8/2340B - Total Hardness EPA 624 - TAH EPA 625 SIM - TAqH 2540D - Total Suspended Solids 9222D - Fecal Coliform 200.8 - Dissolved Cu (Lab Filter)																				
RESERVED for lab use SAMPLE IDENTIFICATION DATE mm/dd/yy TIME HH:MM MATRIX/MATRIX CODE												CONTAINERS		Comp Grab MI (Multi-incremental)												REMARKS/LOC ID	
(1AD) SWM 03-04 09/17/20 09:50 WS 5 G ✓ ✓																								(17AB)			
(2AD) SWM 04-04 09:55 WS 5 G ✓ ✓																								(18AB)			
(3AB) SWM 05-04 11:05 WS 10 G ✓ ✓ ✓ ✓																								(19AB)			
(4AB) SWM 06-04 11:40 WS 5 G ✓ ✓																								(20AB)			
(5AI) SWM 07-04 12:00 WS 10 G ✓ ✓ ✓ ✓																								(21AB)			
(6AD) SWM 08-04 12:10 WS 5 G ✓ ✓																								(22AB)			
(7AD) SWM 08-04 Dup 12:15 WS 5 G ✓ ✓																								(23AB)			
(8AI) SWM 09-04 12:45 WS 10 G ✓ ✓ ✓ ✓																								(24AB)			
(9AD) SWM 10-04 12:55 WS 5 G ✓ ✓																								(25AB)			
(10AD) SWM 11-04 09:16 WS 5 G ✓ ✓																								(26AB)			
Relinquished By: (1) <i>Kay [Signature]</i> Date 9/17/20 Time 14:10 Received By:					Section 4		DOD Project? Yes (No)					Data Deliverable Requirements:															
					Relinquished By: (2)					Cooler ID:		Requested Turnaround Time and/or Special Instructions:															
					Relinquished By: (3)					Temp Blank °C: 1) 3.2 DS8 2) 4.6 D21 3) 3.6 DS7 4) 3.2 DS4 5) 1.5 DS1 or Ambient []					Chain of Custody Seal: (Circle) INTACT BROKEN <u>ABSENT</u>												
					Relinquished By: (4) Date 9/17/20 Time 1410 Received For Laboratory By: <i>[Signature]</i>					Delivery Method: Hand Delivery [] Commerical Delivery []																	

http://www.sgs.com/terms-and-conditions



SGS North America Inc.
CHAIN OF CUSTODY RECORD



1205053

www.us.sgs.com

Section 1	CLIENT: HDR Inc.					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page <u>2</u> of <u>2</u>									
	CONTACT: Cindy Helmericks					PHONE #: 907-644-2017					Section 3		Preservative												
	PROJECT NAME: MOA Stormwater Outfall Monitoring					PROJECT/ PWSID/ PERMIT#: 10227978					CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis*												NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS
	REPORTS TO: Cindy Helmericks					E-MAIL: cindy.helmericks@hdrinc.com							None HCl Na2SO4												
INVOICE TO: MOA HDR Inc. KAC					QUOTE #: QUOTE #:					5210B - BOD EPA 200.8/2340B - Total Hardness EPA 624 - TAH EPA 625 SIM - TAqH 2540D - Total Suspended Solids 9222D - Fecal Coliform 200.8 - Dissolved Cu (Lab Filter)															
					P.O. #:																				
Section 2	RESERVED for lab use	SAMPLE IDENTIFICATION			DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	#	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	REMARKS/LOC ID						
	(11A)	SWM 12-04			09/17/20	10:15	WS	16	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	27AB						
	(12A)	SWM 12-04 Dup			↓	10:20	WS	10	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	28AB						
	(13-14A)	SWM 12-04			↓	10:25	WS	17	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	(16AC) MS/MSD 29-30AB						
	(15A)	SWM TripBlank-04			↓	10:15	WS	3	G										Trip Blanks (3)						
Section 5	Relinquished By: (1)			Date	Time	Received By:			Section 4		DOD Project? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			Data Deliverable Requirements:											
	<i>[Signature]</i>			9/17/20	14:10	<i>[Signature]</i>			Cooler ID:																
	Relinquished By: (2)			Date	Time	Received By:			Requested Turnaround Time and/or Special Instructions:																
	Relinquished By: (3)			Date	Time	Received By:			Temp Blank °C:		Chain of Custody Seal: (Circle)														
Relinquished By: (4)			Date	Time	Received For Laboratory By:			1) 3.2 D58		INTACT BROKEN <input checked="" type="checkbox"/> ABSENT															
<i>[Signature]</i>			9/17/20	14:10	<i>[Signature]</i>			2) 4.0 D41																	
								3) 3.6 D57																	
								4) 3.2 D59																	
								5) 1.5 D51 or Ambient []																	
										Delivery Method: Hand Delivery <input checked="" type="checkbox"/> Commercial Delivery []															
										http://www.sgs.com/terms-and-conditions															



SGS Workorder #:

1205053



1 2 0 5 0 5 3

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	<input checked="" type="checkbox"/> Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	<input type="checkbox"/> N/A	absent
COC accompanied samples?	<input checked="" type="checkbox"/> Yes	
DOD: Were samples received in COC corresponding coolers?	<input type="checkbox"/> N/A	
<input type="checkbox"/> N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	<input checked="" type="checkbox"/> Yes	Cooler ID: 1 @ 3.2 °C Therm. ID: D58
	<input checked="" type="checkbox"/> Yes	Cooler ID: 2 @ 4.0 °C Therm. ID: D21
	<input checked="" type="checkbox"/> Yes	Cooler ID: 3 @ 3.6 °C Therm. ID: D57
	<input checked="" type="checkbox"/> Yes	Cooler ID: 4 @ 3.2 °C Therm. ID: D59
	<input checked="" type="checkbox"/> Yes	Cooler ID: 5 @ 1.5 °C Therm. ID: D51
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		
*If >6°C, were samples collected <8 hours ago?	<input type="checkbox"/> N/A	
If <0°C, were sample containers ice free?	<input type="checkbox"/> N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	<input checked="" type="checkbox"/> Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	<input checked="" type="checkbox"/> Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	<input checked="" type="checkbox"/> Yes	
Were proper containers (type/mass/volume/preservative***) used?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes ***Exemption permitted for metals (e.g,200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<input checked="" type="checkbox"/> Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	<input checked="" type="checkbox"/> Yes	
Were all soil VOAs field extracted with MeOH+BFB?	<input type="checkbox"/> N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		

Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1205053001-A	Na2S2O3 for Chlorine Redu	OK	1205053009-D	No Preservative Required	OK
1205053001-B	HNO3 to pH < 2	OK	1205053010-A	Na2S2O3 for Chlorine Redu	OK
1205053001-C	No Preservative Required	OK	1205053010-B	HNO3 to pH < 2	OK
1205053001-D	No Preservative Required	OK	1205053010-C	No Preservative Required	OK
1205053002-A	Na2S2O3 for Chlorine Redu	OK	1205053010-D	No Preservative Required	OK
1205053002-B	HNO3 to pH < 2	OK	1205053011-A	Na2S2O3 for Chlorine Redu	OK
1205053002-C	No Preservative Required	OK	1205053011-B	HNO3 to pH < 2	OK
1205053002-D	No Preservative Required	OK	1205053011-C	No Preservative Required	OK
1205053003-A	Na2S2O3 for Chlorine Redu	OK	1205053011-D	No Preservative Required	OK
1205053003-B	HNO3 to pH < 2	OK	1205053011-E	No Preservative Required	OK
1205053003-C	No Preservative Required	OK	1205053011-F	No Preservative Required	OK
1205053003-D	No Preservative Required	OK	1205053011-G	HCL to pH < 2	OK
1205053003-E	No Preservative Required	OK	1205053011-H	HCL to pH < 2	OK
1205053003-F	No Preservative Required	OK	1205053011-I	HCL to pH < 2	OK
1205053003-G	HCL to pH < 2	OK	1205053012-A	Na2S2O3 for Chlorine Redu	OK
1205053003-H	HCL to pH < 2	OK	1205053012-B	HNO3 to pH < 2	OK
1205053003-I	HCL to pH < 2	OK	1205053012-C	No Preservative Required	OK
1205053004-A	Na2S2O3 for Chlorine Redu	OK	1205053012-D	No Preservative Required	OK
1205053004-B	HNO3 to pH < 2	OK	1205053012-E	No Preservative Required	OK
1205053004-C	No Preservative Required	OK	1205053012-F	No Preservative Required	OK
1205053004-D	No Preservative Required	OK	1205053012-G	HCL to pH < 2	OK
1205053005-A	Na2S2O3 for Chlorine Redu	OK	1205053012-H	HCL to pH < 2	OK
1205053005-B	HNO3 to pH < 2	OK	1205053012-I	HCL to pH < 2	OK
1205053005-C	No Preservative Required	OK	1205053013-A	HNO3 to pH < 2	OK
1205053005-D	No Preservative Required	OK	1205053013-B	No Preservative Required	OK
1205053005-E	No Preservative Required	OK	1205053013-C	No Preservative Required	OK
1205053005-F	No Preservative Required	OK	1205053013-D	HCL to pH < 2	OK
1205053005-G	HCL to pH < 2	OK	1205053013-E	HCL to pH < 2	OK
1205053005-H	HCL to pH < 2	OK	1205053013-F	HCL to pH < 2	OK
1205053005-I	HCL to pH < 2	OK	1205053014-A	HNO3 to pH < 2	OK
1205053006-A	Na2S2O3 for Chlorine Redu	OK	1205053014-B	No Preservative Required	OK
1205053006-B	HNO3 to pH < 2	OK	1205053014-C	No Preservative Required	OK
1205053006-C	No Preservative Required	OK	1205053014-D	HCL to pH < 2	OK
1205053006-D	No Preservative Required	OK	1205053014-E	HCL to pH < 2	OK
1205053007-A	Na2S2O3 for Chlorine Redu	OK	1205053014-F	HCL to pH < 2	OK
1205053007-B	HNO3 to pH < 2	OK	1205053015-A	HCL to pH < 2	OK
1205053007-C	No Preservative Required	OK	1205053015-B	HCL to pH < 2	OK
1205053007-D	No Preservative Required	OK	1205053015-C	HCL to pH < 2	OK
1205053008-A	Na2S2O3 for Chlorine Redu	OK	1205053016-A	Na2S2O3 for Chlorine Redu	OK
1205053008-B	HNO3 to pH < 2	OK	1205053016-B	No Preservative Required	OK
1205053008-C	No Preservative Required	OK	1205053016-C	No Preservative Required	OK
1205053008-D	No Preservative Required	OK	1205053017-A	No Preservative Required	OK
1205053008-E	No Preservative Required	OK	1205053017-B	HNO3 to pH < 2	OK
1205053008-F	No Preservative Required	OK	1205053018-A	No Preservative Required	OK
1205053008-G	HCL to pH < 2	OK	1205053018-B	HNO3 to pH < 2	OK
1205053008-H	HCL to pH < 2	OK	1205053019-A	No Preservative Required	OK
1205053008-I	HCL to pH < 2	OK	1205053019-B	HNO3 to pH < 2	OK
1205053009-A	Na2S2O3 for Chlorine Redu	OK	1205053020-A	No Preservative Required	OK
1205053009-B	HNO3 to pH < 2	OK	1205053020-B	HNO3 to pH < 2	OK
1205053009-C	No Preservative Required	OK	1205053021-A	No Preservative Required	OK

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1205053021-B	HNO3 to pH < 2	OK			
1205053022-A	No Preservative Required	OK			
1205053022-B	HNO3 to pH < 2	OK			
1205053023-A	No Preservative Required	OK			
1205053023-B	HNO3 to pH < 2	OK			
1205053024-A	No Preservative Required	OK			
1205053024-B	HNO3 to pH < 2	OK			
1205053025-A	No Preservative Required	OK			
1205053025-B	HNO3 to pH < 2	OK			
1205053026-A	No Preservative Required	OK			
1205053026-B	HNO3 to pH < 2	OK			
1205053027-A	No Preservative Required	OK			
1205053027-B	HNO3 to pH < 2	OK			
1205053028-A	No Preservative Required	OK			
1205053028-B	HNO3 to pH < 2	OK			
1205053029-A	No Preservative Required	OK			
1205053029-B	HNO3 to pH < 2	OK			
1205053030-A	No Preservative Required	OK			
1205053030-B	HNO3 to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

Appendix D
Field & Laboratory Data Validation

Field & Laboratory Data Validation

Data review focused on the following quality control (QC) parameters and their overall effects on the data:

- Physical parameter replicate comparisons
- Sample handling and holding time compliance
- Field replicate comparison for conventional and organic constituents
- Comparisons of laboratory controls (e.g., matrix spike/matrix spike duplicates).

1. Physical Parameter Comparisons

Precipitation

Precipitation was measured at four project locations within the Anchorage basin using tipping bucket rain gauges. Daily rainfall data from the PANC weather station at the AIA were used to supplement the four project rain gauges.

The study plan specifies that storm events must meet the following criteria: a storm event must be ≥ 0.1 inch of rain in 24 hours (hr) and be preceded by 24 hr of dry weather (< 0.1 inch of rain). These criteria were applied on a 24-hr storm basis rather than a calendar basis since storms often commence in late evening the day before sampling. All four storm events met the criteria of exhibiting ≥ 0.1 inch of rain in 24 hr. Total rainfall as measured at PANC and the four tipping bucket stations in the monitoring area during each monitored event ranged from a low of 0.03 inches at Spencer during the fourth event to 0.72 inches at Thomas during the fourth event. In all storm events, sampling was completed within 24 hours from the start of a storm. In all sampling events, precipitation recorded at all four project gauges during the preceding 24-hr period was < 0.1 inches. Based on these data, all four storms that were sampled were considered to have met storm event criteria.

Flow Measurements

Flow velocities were measured using an acoustic Doppler flow meter at most stations. Although not required by the QAP, duplicative flow measurements were taken at SWM08 and SWM12 during the four sampling events. Relative percent differences (RPDs) between flow velocities ranged from 2.1 to 10.9 indicating good agreement between measurements (Table 1). This parameter was duplicated at a rate of 20% during 2020.

Table 1. Field Duplicate Relative Percent Difference for Doppler Flow Measurements

Storm Event Date	SWM08	SWM12
8/11/2020	3.0	4.3
8/24/2020	5.1	10.9
8/31/2020	2.1	5.2
9/17/2020	1.8	5.7

At station SWM07, the volumetric method was utilized to determine flow during the first two sampling events due to low flow, where repeated bucket fill-time measurements were made, and the average measurement was used to calculate the flow velocity. No measurement quality objectives for this method were provided in the project QAP, as the parameter is essentially self-correcting as it includes repeated measurements. However, the coefficient of variation (CV), a percentage representing the standard deviation divided by the mean of a population, was calculated to determine variability of this measurement. Bucket measurements showed low CVs of $\leq 10\%$ (Table 2), indicating good consistency between measurements.

Table 2. Coefficients of Variation for Volume/Time Flow Measurements

Storm Event Date	SWM07
8/11/2020	5.24
8/24/2020	8.9
8/31/2020	---
9/17/2020	---

2. Sample Handling and Holding Time Compliance

For most analyses, samples were taken directly from the stormwater flow into laboratory-cleaned sample bottles; for TAH samples, small “VOA” vials containing preservative were typically filled from the PAH sample bottles. For every storm event, all samples were appropriately labeled, and the chains of custody completed as prescribed in the QAP. For all storm events, samples were maintained in the coolers at less than 6 °C or delivered to the laboratory at ambient temperatures within a few hours of sampling, which meets EPA’s sampling preservation and holding requirements for temperature. Sample custody was maintained; samples were hand delivered directly to the laboratory by the sampling crew within hours of sample collection.

The holding times specified in the QAP (MOA 2016) were met for all parameters.

3. Comparisons of Field Replicate Analyses

Conventional Parameters

Replicates of parameters analyzed in the field were taken as a measure of field variability/ precision, where precision was calculated as either an RPD (for dissolved oxygen {DO}) or the difference between measurements (for pH, turbidity, temperature, and conductivity) as defined in the QAP. However, it should be noted that the precision values listed in the QAP for field instruments pertain to the precision of the instrument and are not realistic goals for natural variability of stormwater field measurements. In a high stormwater outflow situation, samples collected only a few minutes apart would be expected to show considerable variability considering that different water masses are being discharged, even though samples are being collected only minutes apart. As such, comparison of field duplicate results here, though compared to the QAP-provided precision standards, are more indicative of field variability than actual instrument precision.

Each sampling event included collection of field replicates at two stations. Field analyses included measurement of the conventional parameters of DO, pH, temperature, turbidity, and specific conductivity. Replicates were taken at a rate of 20% for these parameters, exceeding the 15% prescribed

for all parameters in the QAP, and twice for all sampling days, exceeding the once/day requirement in the study plan. Table 3 provides the calculated field variability/precision for conventional parameters measured in the field.

Table 3. Precision and Variability of Field Parameters

Parameter	QAP Standard	8/11/2020		8/24/2020		8/31/2020		9/17/2020	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
DO	10% RPD	0.85	3.34	0.76	2.42	0.00	4.73	0.88	0.80
pH	±0.2 units	0.07	0.04	0.02	0.03	0.02	0.01	0.02	0.00
Turbidity	±1 NTU	0.6	5.0	3.0	5.9	1.7	5.0	1.3	0.2
Temperature	±0.4 °C	0.0	0.1	0.1	0.0	0.02	0.01	0.1	0.0
Conductivity	±1 µS/cm	0.7	8	2	4	4	11	0.7	2

Values in **bold** and **red** exceeded the measurement quality objective specified in the QAP.

DO, pH, and temperature met the precision goals during all sampling events. Turbidity and conductivity frequently did not meet the precision limits due to the variability of the discharge. Failure to meet the precision sensitivities prescribed in the QAP likely reflect the heterogeneous nature of stormwater flow rather than sampling anomalies. Although not specified in the outfall monitoring plan, conductivity was monitored to provide additional information to the field crew.

Replicate samples for the conventional parameters (TSS, BOD, and fecal coliform) were taken as field duplicates at SWM08 and SWM12 and analyzed by the laboratory as a measure of field variability/precision. Replicates were taken at a rate of 20%, exceeding the 15% prescribed for all parameters in the QAP and the once/day requirement in the study plan. Field variability was less than the QAP RPD limits in all but one case (Table 4). The RPD for field replicates of fecal coliform for SWM12 during the fourth storm event was 70%, with a QAP limit of 60%. Again, failure to meet the precision sensitivities prescribed in the QAP likely reflect the heterogeneous nature of stormwater flow rather than sampling anomalies. Calculated RPDs for TSS met the standards prescribed in the QAP. RPDs for BOD were also calculated, but no limits were provided in the project QAP for this parameter, although all RPDs were ≤25%.

Table 4. Field Duplicate Results for Conventional Parameters

Parameter	QAP Precision (RPD)	8/11/2020		8/24/2020		8/31/2020		9/17/2020	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
TSS	25	4	8	10	12	6	5	1	0.6
BOD	NA	5.3	0.2	0.4	0.0	19.7	7.9	2	21
Fecal Coliform	60	56	6	20	8	6	24	5	70

Values in **bold** and **red** exceeded the precision measurement quality objective specified in the QAP.

Dissolved Copper and Hardness

Field replicates of dissolved copper and hardness were taken at SWM08 and SWM12. Replicates were taken at a rate of 20%, exceeding the 15% prescribed for all parameters in the QAP and the once/day requirement in the study plan. RPD results are presented in Table 5 and show variability below 20% for both parameters and all events. Hardness RPD during the fourth storm event at SWM08 could not be calculated due to both results being non-detect.

Table 5. Field Duplicate Results for Dissolved Copper and Hardness as CaCO₃

Parameter	QAP Precision (RPD)	8/11/2020		8/24/2020		8/31/2020		9/17/2020	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
Dissolved Copper	20	1	1	13	10	15	8	9	2
Hardness	20	0	0	14	2	8	1	NC	3

Values in **bold** and **red** exceeded the precision measurement quality objective specified in the QAP. NC denotes that RPD could not be calculated due to non-detect values.

Organic Parameters

Field replicates for the TAH (BETX) and PAH constituents were obtained at SWM12 during each of the four storm events. This represents a replication rate of 25%, which exceeds the 15% prescribed in the QAP and meets the once/day requirement of the study plan.

The field precision RPDs for TAH and PAH constituents are presented in Table 6. TAH concentrations were all below detection limits (ND) and RPDs were not calculated. Most individual PAH analytes were below the detection limits. Those with values detected showed RPD precisions ranging from about 3–26%, all within the QAP specified limit of 30% except for naphthalene and phenanthrene sampled during the fourth storm being over at 67% and 45% respectively. The fourth storm is the only storm that naphthalene was detected and at very small concentration in the duplicate sample. The primary sample had a non-detected concentration and the duplicate sample concentration was just above the limit of detection (LOD), creating a small variance between the two samples and is likely due to the heterogeneous nature of stormwater. However, the RPD was not calculated due to the non-detected concentration. Phenanthrene RPD during the fourth storm event was 45% and is also likely due to the heterogeneous nature of stormwater.

4. Comparisons of Laboratory Controls

Verification analyses for laboratory parameters were conducted by SGS North America, Inc., the laboratory performing the analyses. SGS is certified by the EPA and the Alaska Drinking Water Program and has an approved QA/QC program. Analytical methods and testing procedures were in adherence with the QAP, standard methods, and EPA-approved protocols and guidelines.

Conventional Parameters

Laboratory method blanks were performed for the conventional parameters BOD, TSS, fecal coliform, and copper. None of the method blanks had any detections. The laboratory control sample and sample duplicate (LCS/LCSD) for the conventional parameters for all storm events were within the laboratory control limits except for TSS.

Table 6. Field Duplicate Results for TAH and PAH

Parameter	QAP Precision (RPD)	8/11/2020	8/24/2020	8/31/2020	9/17/2020
		SWM12	SWM12	SWM12	SWM12
TAH (BETX)					
Benzene	20	---	---	---	---
Ethylbenzene	20	---	---	---	---
Toluene	20	---	---	---	---
o-Xylene	20	---	---	---	---
p & m-Xylenes	20	---	---	---	---
PAH					
Acenaphthene	30	---	---	---	---
Acenaphthylene	30	---	---	---	---
Anthracene	30	---	---	---	---
Benzo(a)anthracene	30	---	---	---	---
Benzo(a)pyrene	30	---	---	---	---
Benzo(b)fluoranthene	30	---	---	---	---
Benzo(g,h,i,)perylene	30	---	---	---	---
Benzo(k)fluoranthene	30	---	---	---	---
Chrysene	30	---	---	---	---
Dibenzo(a,h)anthracene	30	---	---	---	---
Fluoranthene	30	7	---	13	13
Fluorene	30	---	---	---	---
Indeno(1,2,3-cd)pyrene	30	---	---	---	---
Naphthalene	30	---	---	---	NC
Phenanthrene	30	---	---	13	45
Pyrene	30	3	---	26	13

Values in **bold** and **red** exceeded the precision measurement quality objective specified in the QAP. “---“denotes non-detect values and RPDs could not be calculated.

The first storm TSS laboratory duplicates were reported with RPDs of 13.3% and 16.2%, both above the 5% laboratory RPD limit. One of the TSS laboratory duplicates for the second event were reported with RPD of 10% while the second RPD was below the 5% limit at 0%. One of the TSS laboratory duplicates for the third event was reported with RPDs of 10.6% above the 5% laboratory RPD limit. The fourth storm TSS laboratory duplicates met the laboratory requirement of 5%. All RPDs are below the 25% QAP limit for TSS.

Dissolved Copper and Hardness

Hardness is computed from magnesium and calcium so the QC for those compounds relate to the quality of the hardness results. All metals and hardness data were within QC limits this year.

Organic Parameters

Trip blanks were collected for the TAH analyses to determine whether the handling of the samples introduced contaminants. The trip blanks for all four storm events showed no evidence of contamination.

The Laboratory and Method Blanks for organics (both TAH and PAH) were all reported as non-detect.

LCS/LCSDs were run, as were Matrix Spikes and Spike Duplicates (MS/MSD), to confirm the accuracy and precision of the analysis of the organic parameters. Spike recoveries confirm accuracy and the RPD confirms precision. Matrix Spikes confirm the ability to see the target analyte in the sample. The MS/MSD results are presented for the organic analysis in Table 7.

All spike recoveries and their RPDs were within acceptable range for the TAH.

For PAH, the analysis of the samples from all four storm events showed that many of the PAH analytes in the matrix spikes were recovered at levels that fell below both the QAP and laboratory control limits during the first storm. However, the LCS spike recoveries were in range for those parameters, indicating a potential matrix interference with these results. Data values were evaluated by looking at those results where the recoveries were found to be 20 points outside the lower laboratory limit or exhibiting an RPD >30. Further, the sample results associated with those analytes were examined in detail as low recoveries coupled with low or non-detect results are an indication that the laboratory is unable to recover the analyte in the matrix. These results were re-qualified with a "J-" or a "UJ-" (if not detected) to indicate that sample results may exhibit a low bias based on poor spike recoveries ascribed to probable matrix interference, although initial qualification of batch sample data was performed by the laboratory based on their best professional judgement, since LCS recoveries were within range.

The recovery of PAH compounds during the extraction and analysis process was represented by the surrogates 2-Methylnaphthalene-d10 and Fluoranthene-d10, which were recovered in range for all samples.

In qualifying the PAH data, it is important to note that the PAH constituents are hydrophobic and are likely to sorb or otherwise associate with particles in the stormwater. Thus, where the quality of the stormwater is highly variable with respect to particulates, PAH constituent exceedances of precision and accuracy limits may be expected. In addition, it should be noted that the MS/MSD analyses for PAH were based on separate field replicates that were obtained for this purpose. Therefore, RPD differences in the analyses may be the result of field variability and not necessarily due to any issues with the laboratory analysis.

Table 7. Laboratory Precision and Accuracy for TAH and PAH

Parameter	QAP Standard		8/11/2020		8/24/2020		8/31/2020		9/17/2020	
	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy
	RPD	% Rec	RPD	% Rec	RPD	% Rec	RPD	% Rec	RPD	% Rec
TAH										
Benzene	20	79-120	0.7	104/103	1.8	106/104	3.7	107/103	4.5	103/98
Ethylbenzene	20	79-121	3.6	104/100	1.7	112/110	0.3	110/111	1.8	105/107
Toluene	20	80-121	1.6	98/96	2.7	105/102	0.8	104/103	5.4	93/98
o-Xylene	20	78-122	0.8	101/100	2.1	113/110	0.4	110/111	2.3	112/109
p & m-Xylenes	20	80-121	1.7	102/100	0.2	110/110	0.5	111/110	2.4	113/110
PAH										
Acenaphthene	30	48-114	27	57/44	8.4	73/67	9.4	70/65	7.5	66/72
Acenaphthylene	30	35-121	28.7	62/47	5.0	77/73	8.9	77/71	6.5	71/76
Anthracene	30	53-119	28.6	55/41	5.7	81/76	13.7	79/70	1.2	71/72
Benzo(a)anthracene	30	59-120	38.1	31/21	5.0	73/70	14.4	71/63	4.8	71/68
Benzo(a)pyrene	30	53-120	45.8	22/14	5.5	90/85	13.3	84/75	2.5	79/77
Benzo(b)fluoranthene	30	53-126	46	26/16	2.7	88/85	14.7	84/74	2.9	78/76
Benzo(g,h,i,)perylene	30	44-128	43	17/11	5.2	89/85	11.9	79/71	2.5	72/70
Benzo(k)fluoranthene	30	54-128	43	23/15	7.3	87/81	12.3	79/71	5.0	74/71
Chrysene	30	57-120	37	38/26	5.3	85/81	16.3	84/73	5.5	76/72
Dibenzo(a,h)anthracene	30	44-131	47	16/10	5.9	92/87	11.2	80/73	2.6	77/75
Fluoranthene	30	58-120	29.3	50/36	4.8	84/80	15.9	81/70	5.5	74/69
Fluorene	30	50-118	27	57/44	6.1	79/74	12.0	78/71	5.1	71/75
Indeno(1,2,3-cd)pyrene	30	48-130	49.7	17/10	5.9	97/91	11.5	84/77	2.0	80/79
Naphthalene	30	43-114	25.8	56/43	6.6	73/68	5.2	71/69	3.9	73/75
Phenanthrene	30	53-115	28.4	58/43	4.9	78/75	12.4	76/68	3.5	73/76
Pyrene	30	53-121	30.2	49/35	5.1	81/77	15.9	78/68	4.4	72/68

Values in **bold** and **red** did not meet the measurement quality objectives in the QAP.

5. Completeness

Calculated completeness for field sample collection, field measurement, and laboratory results all well exceeded the project goal of 90%. All (100%) of the intended samples were collected for laboratory analysis. Valid field analytical measurements (DO, pH, temperature, turbidity, and conductivity) were recorded 100% of the time; no water quality data points were dismissed. Laboratory data were determined to be 100% complete, with no laboratory results deemed unacceptable or un-usable.

6. Conclusions

A careful review of the results confirmed that the dataset for this project is acceptable and can be used to meet project goals as defined in the study plan. Sampling process and completeness criteria were all met. Holding times were met for all samples for all four storms. Field duplication results for some parameters fell outside QAP-specified levels where expected, which is consistent with the fact that these “duplicates” are actually replicates that indicate field variability rather than a measurement of precision. Low percent recoveries were seen in some PAH analytes in both the MS and MSDs during the first storm event, resulting in these analytes being re-qualified as potentially biased low due to potential matrix interference inherent in the stormwater samples. Despite the minor QC issues identified in this report, overall evaluation of the analytical QA/QC data indicates that the project data are, for the most part, within established performance criteria and can be used for characterization of stormwater for this project.

7. References

MOA 2016. Monitoring, Evaluation, and Quality Assurance Plan, APDES Permit No. AKS-052558. Prepared for Alaska Department of Environmental Conservation, Division of Water. Prepared by HDR Alaska, Inc. and Municipality of Anchorage.

Appendix E

Field Logs

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>03</u>		DATE: <u>8/11/2020</u>		SAMPLE TIME: <u>12:05</u>			
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>old Seward / Sylvan W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		<u>Flow Meter</u> <u>0.2' depth</u>			
Flow Meter	Flow Speed (ft/s): <u>1.63</u>	Water Depth (in): <u>3.00</u>	Pipe Diam (in): <u>36</u>				
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TII Rental Proplus</u>		Turbidimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.0</u>	<u>107.7</u>	<u>9.03</u>	<u>87.5</u>	<u>7.4</u>	<u>25.8</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>03</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>LS</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>et none</u>						
CLARITY	<u>mostly clear / slightly cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>small bit of trash DS</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Overcast</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

17' across

Cond 249
85.0

Reviewed By: [Signature]
ES ponce

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>04</u>		DATE: <u>8/11/2020</u>		SAMPLE TIME: <u>1210</u>		
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>old sewerd / Sylvan E.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket		Flow Meter <u>0.3' depth</u>		
Flow Meter	Flow Speed (ft/s): <u>0.61</u>	Water Depth (in): <u>3.5</u>	Pipe Diam (in): <u>18</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>711 Rental Proplus</u>		Turbidimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>15.6</u>	<u>203.3</u>	<u>8.14</u>	<u>81.9</u>	<u>7.44</u>	
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>04</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -01 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:				Sampler's Initials: <u>LS</u>		
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>none</u>					
COLOR	<u>none</u>					
CLARITY	<u>slightly cloudy</u>					
FLOATABLES	<u>none</u>					
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>none</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	<u>trash DS</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Overcast, grasses DS, very slow flow, almost</u>						
<u>backwatering</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

11.5' across

Conduct. 166.5

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>05</u>		DATE: <u>8/11/2020</u>		SAMPLE TIME: <u>13:10</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE high school</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter			
Flow Meter		Flow Speed (ft/s): <u>1.03</u>		Water Depth (in): <u>1.5</u>			
Bucket Measurements		Time 1 (s)		Time 2 (s)			
Bucket: 1-gal 5-gal		<u>15</u>					
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental Proplus</u>		Turbidimeter: <u>#1</u>			
MEASUREMENT		Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>05</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<input checked="" type="checkbox"/>		
Description of QC Samples:				Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>misty, slightly cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>Slight DS</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>overcast</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

9.5" across

Can 2 ask 85.1

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>06</u>		DATE: <u>8 / 11 / 2020</u>		SAMPLE TIME: <u>11:00</u>			
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maplewood Rd St.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>0.15' depth</u>			
Flow Meter		Flow Speed (ft/s): <u>1.28</u>		Water Depth (in): <u>1.5</u>			
Pipe Diam (in): <u>24</u>		<i>9' across</i>					
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)		
Bucket: 1-gal 5-gal							
Total Time		Rate (gal/s)					
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>T11 Rental Pro Plus</u>		Turbidimeter: <u>#1</u>			
Temp (°C)		SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT		<u>14.3</u>	<u>78.9</u>	<u>8.75</u>	<u>85.6</u>		
FIELD REPLICATE							
Turb (NTU)		<u>14.3</u>					
<i>Cond µS/cm 62.8</i>							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>06</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>none</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>trash DS, dog feces</u>		<u>around.</u>				
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Culvert rusted out ~ 2 ft into culvert, infiltration from there. leaves ↓. dog feces around</u>							
Photos: <input checked="" type="radio"/> Yes <input type="radio"/> No							

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>07</u>		DATE: <u>8 / 11 / 2020</u>		SAMPLE TIME: <u>9:10</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) <u>Bucket</u> Flow Meter <u>KRS</u>							
Flow Meter	Flow Speed (ft/s):		Water Depth (in): <u>7/8</u>	Pipe Diam (in): <u>24</u> 7 in across			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: <u>1-gal</u> 5-gal	<u>46</u>	<u>5.95</u>	<u>6.15</u>	<u>6.24</u>	<u>24.34</u>	<u>0.169</u>	
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>ProPlus, TII Rental</u>		Turbidimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.5</u>	<u>53.7</u>	<u>8.99</u>	<u>88.2</u>	<u>6.88</u>	<u>89.1</u> Cond <u>45%</u> <u>42.9</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM 07 -01 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<u>Trip # 1</u>		
Description of QC Samples:			Sampler's Initials: <u>LS</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>slightly met. llic.</u>						
COLOR	<u>clear/cloudy none</u>						
CLARITY	<u>slightly cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>overcast/ cloudy, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>0 8</u>		DATE: <u>8 / 11 / 2020</u>		SAMPLE TIME: <u>930, Dup 940</u>			
OUTFALL/NODE ID: <u>86-1</u>		PHYSICAL LOCATION: <u>Seward Highway S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>4.58</u>		Flow Meter <u>Flow Meter</u>			
Flow Meter		Flow Speed (ft/s): <u>4.72</u>		Water Depth (in): <u>0.34</u> ^{3.6 in}			
Pipe Diam (in): <u>48</u>							
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TI Rental ProPlus</u>			Turbidimeter: <u>21</u>		
Temp (°C)		SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	Conductivity
MEASUREMENT		<u>14.0</u>	<u>83.7</u>	<u>9.37</u>	<u>91.0</u>	<u>6.74</u>	<u>27.5</u>
FIELD REPLICATE		<u>14.0</u>	<u>84.4</u>	<u>9.45</u>	<u>91.6</u>	<u>6.81</u>	<u>26.9</u>
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>0 8</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>0 8</u> -01 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>none</u>						
COLOR	<u>slight tea color</u>						
CLARITY	<u>cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>DS, little trash</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>overcast cloudy, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

A

STATION ID: SWM <u>09</u>		DATE: <u>8/11/2020</u>		SAMPLE TIME: <u>10:10</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)	Bucket		Flow Meter <u>0.15' - flow rod</u>				
Flow Meter	Flow Speed (ft/s): <u>0.16</u>	Water Depth (in): <u>1 5/8</u>		Pipe Diam (in): <u>24</u> <i>12" across</i>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TIT rental ProPlus</u>			Turbidimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.2</u>	<u>132.3</u>	<u>8.21</u>	<u>80.0</u>	<u>7.29</u>	<u>28.6</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>LS</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	none						
COLOR	slight tea						
CLARITY	slight cloudy						
FLOATABLES	none						
DEPOSITS OR STAINS	none						
SHEEN	none						
SURFACE SCUM	none						
DEBRIS	trash everywhere						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>overcast, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

0.15
0.16

Cond usion
105.1

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: <u>SWM 10</u>		DATE: <u>8/11/2020</u>		SAMPLE TIME: <u>1030</u>			
OUTFALL/NODE ID: <u>525-1</u>		PHYSICAL LOCATION: <u>Ben Burke S</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) Bucket <u>Flow Meter</u>		<u>Flow meter - 0.15' depth</u>					
Flow Meter	Flow Speed (ft/s): <u>2.84</u>	Water Depth (in): <u>2</u>	Pipe Diam (in): <u>24</u>				
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TII Rental Proplus</u>			Turbidimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.4</u>	<u>201.9</u>	<u>10.24</u>	<u>93.8</u>	<u>7.00</u>	<u>6.33</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>10</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM 10 -01 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>LS</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>none</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none iron</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>trash everywhere, around</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Lightly raining, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

11" across S

Cond
146.7

KRS

Reviewed By: [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>11</u>	DATE: <u>8/11/2020</u>	SAMPLE TIME: <u>1130</u>
OUTFALL/NODE ID: <u>348-1</u>	PHYSICAL LOCATION: <u>John's Rd and Botanical Cr.</u>	

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	Flow Meter <u>1ft depth</u>				
Flow Meter	Flow Speed (ft/s): <u>0.72</u>	Water Depth (in): <u>11.75</u>	Pipe Diam (in): <u>36</u> 25" across			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>TT Rental Proplus</u>			Turbidimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>15.9</u>	<u>36.8</u>	<u>9.31</u>	<u>94.2</u>	<u>7.00</u>	<u>77.1</u> 30.4
FIELD REPLICATE						

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>11</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							

Description of QC Samples:

Sampler's Initials: LS

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>None</u>	
COLOR	<u>Brown grey</u>	
CLARITY	<u>Cloudy</u>	
FLOATABLES	<u>none</u>	
DEPOSITS OR STAINS	<u>none</u>	
SHEEN	<u>none</u>	
SURFACE SCUM	<u>none</u>	
DEBRIS	<u>trash in area and some in flow.</u>	

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Trash floated out of culvert, birch seeds, grass, leaves in flow, overcast.

Photos: Yes No

Reviewed By: R. J. [Signature]

Date: 8/11/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>1 2</u>		DATE: <u>8 1 1 / 2020</u>		SAMPLE TIME: <u>1240 Dup 12:42</u>			
OUTFALL/NODE ID: <u>14547</u>		PHYSICAL LOCATION: <u>Lynwood Detention Pond.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>3.58</u>		Flow Meter <u>0.3' depth</u>			
Flow Meter	Flow Speed (ft/s): <u>3.43</u>	Water Depth (in): <u>3.25</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental ProPlus</u>		Turbidimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.1</u>	<u>218.5</u>	<u>9.44</u>	<u>92.0</u>	<u>7.42</u>	<u>228</u>	
FIELD REPLICATE	<u>14.2</u>	<u>226.1</u>	<u>9.13</u>	<u>89.2</u>	<u>7.38</u>	<u>223</u>	
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>1 2</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>1 2</u> -01 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>LS</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>Gray / Brown</u>						
CLARITY	<u>cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>Trash DS</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Overcast, grasses, good flow.</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

ms/msd
 12:45
 15" across
 cond usm
 173.1
 179.0

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: <u>SWM 03</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>11:45</u>			
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>Old Seward/Sylvan W</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		<u>Flow Meter</u>			
Flow Meter	Flow Speed (ft/s): <u>1.35</u>		Water Depth (in): <u>2.25</u>		Pipe Diam (in): <u>36</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal					Rate (gal/s)		
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Proplus</u>		Turbimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>12.9</u>	<u>107.7</u>	<u>8.43</u>	<u>80.0</u>	<u>7.46</u>		
FIELD REPLICATE					Turb (NTU)		
					<u>16.3</u>		
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>03</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Organic</u>						
COLOR	<u>Clear - None</u>						
CLARITY	<u>Slight cloudy/clear</u>						
FLOATABLES	<u>-</u>						
DEPOSITS OR STAINS	<u>-</u>						
SHEEN	<u>-</u>						
SURFACE SCUM	<u>-</u>						
DEBRIS	<u>-</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Light Rain Restarted</u>							
* one of the coolers came in above 6°C, all samples were collected in time limits and kept cool during transportation to lab.							

Reviewed By: Kary Gauthier

Date: 08/25/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: <u>SWM 04</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>11:50</u>		
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>Old Seward Sylvania E.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket		<u>Flow Meter</u>		
Flow Meter	Flow Speed (ft/s): <u>0.33</u>	Water Depth (in): <u>2</u>		Pipe Diam (in): <u>18</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Proplus</u>		Turbimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>15.1</u>	<u>246.2</u>	<u>6.79</u>	<u>67.4</u>	<u>7.38</u>	<u>11.0</u>
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
<u>SWM 04 -02</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
<u>SWM _____ -02 Dup</u>						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:				Sampler's Initials: <u>YG</u>		
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>None</u>					
COLOR	<u>Super light tan/tea</u>					
CLARITY	<u>Super light cloudyness</u>					
FLOATABLES	<u>-</u>					
DEPOSITS OR STAINS	<u>-</u>					
SHEEN	<u>-</u>					
SURFACE SCUM	<u>-</u>					
DEBRIS	<u>Trash Downstream</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Light Rain Restarted. Outfall collar uplifted, slight backwater</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: <u>SWM 05</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>13:05</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE High School</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>not deep enough for flow meter, estimated</u>			
Flow Meter		Flow Speed (ft/s): <u>1.3 ft/s</u>		Water Depth (in): <u>0.25</u>			
Pipe Diam (in): <u>24</u>		Bucket Measurements		Time 1 (s)			
Time 2 (s)		Time 3 (s)		Time 4 (s)			
Total Time		Rate (gal/s)		Bucket: 1-gal 5-gal			
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, ProPlus</u>		Turbidimeter: <u>#1</u>			
Temp (°C)		SpC (µS/cm)		DO (mg/L)			
DO (% sat)		pH		Turb (NTU)			
MEASUREMENT		13.5		250.0			
5.87		55.8		6.69			
FIELD REPLICATE		<u>14.1</u>		<u>148.1</u>			
<u>6.82</u>		<u>66.5</u>		<u>7.19</u>			
<u>16.7</u>		EP					
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL		BOD		TSS	
SWM <u>05</u> -02		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
SWM _____ -02 Dup		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
MS/MSD or Lab Dup Samples		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
FIELD QC (Trip/Equip)		<input type="checkbox"/>		<input type="checkbox"/>		Trip # <u>2</u>	
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS			
ODOR		<u>Slight Organic</u>					
COLOR		<u>Light tan/tea</u>					
CLARITY		<u>Lightly cloudy</u>					
FLOATABLES							
DEPOSITS OR STAINS		<u>Slight Rust On Rocks</u>					
SHEEN		<u>Some sheen downstream</u>		<u>in pond below outfall</u>			
SURFACE SCUM		<u>—</u>					
DEBRIS		<u>—</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Overcast No Rain, low flow</u>							
<u>Pond below outfall is also fed by a second outfall, not sampled.</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: <u>SWM 06</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>10:40</u>		
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maplewood Rd. St.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket		Flow Meter		
Flow Meter		Flow Speed (ft/s): <u>0.4</u>		Water Depth (in): <u>2</u> ← flow below corroded pipe		
Pipe Diam (in): <u>24</u>						
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	
Bucket: 1-gal 5-gal						
Total Time		Rate (gal/s)				
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Pro plus</u>		Turbimeter: <u>#1</u>		
Temp (°C)		SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT		<u>19.1</u>	<u>75.1</u>	<u>8.28</u>	<u>80.8</u>	
FIELD REPLICATE		<u>6.80</u>	<u>11.8</u>			
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>06</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____-02 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:				Sampler's Initials: <u>KG</u>		
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>No smell</u>					
COLOR	<u>clear</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>Leaves</u>					
DEPOSITS OR STAINS	<u>-</u>					
SHEEN	<u>-</u>					
SURFACE SCUM	<u>-</u>					
DEBRIS	<u>-</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Trash downstream, bottom of pipe corroded out</u>						
<u>Water depth taken below pipe</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>07</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>09:00</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) <u>Bucket</u> Flow Meter <u>KEG</u>							
Flow Meter	Flow Speed (ft/s): <u>0.5</u>		Water Depth (in): <u>1.0 in</u>		Pipe Diam (in): <u>24 in</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: <u>1-gal</u> 5-gal	<u>2.76</u>	<u>3.09</u>	<u>3.40</u>	<u>3.05</u>	<u>12.30</u>	<u>0.33</u>	
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>3666</u> , <u>777 Rental paper</u>			Turbidimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.8</u>	<u>44.2</u>	<u>8.14</u>	<u>80.9</u>	<u>6.95</u>	<u>108</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)				<u>trip # 2</u>	<u>trip # 2</u>		
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>slightly cloudy.</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Light rain (drizzle), leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: Kathy Paulkover

Date: 08/25/2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>08</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>09:15</u>			
OUTFALL/NODE ID: <u>86-1</u>		PHYSICAL LOCATION: <u>Seward Highway S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u>					
Flow Meter <u>Hach</u>	Flow Speed (ft/s): <u>5.07/4.82</u>	Water Depth (in): <u>3</u>		Pipe Diam (in): <u>48</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TIT Rental, ProPlus</u>		Turbidimeter: # <u>1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.4</u>	<u>40.7</u>	<u>9.14</u>	<u>89.3</u>	<u>6.64</u>	<u>35.6</u>	
FIELD REPLICATE	<u>14.3</u>	<u>42.2</u>	<u>9.21</u>	<u>90.0</u>	<u>6.66</u>	<u>38.6</u>	
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>08</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>08</u> -02 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Light hydrocarbon</u>						
COLOR	<u>Slightly brown</u>						
CLARITY	<u>Slightly cloudy</u>						
FLOATABLES	<u>-</u>						
DEPOSITS OR STAINS	<u>- Iron</u>						
SHEEN	<u>-</u>						
SURFACE SCUM	<u>-</u>						
DEBRIS	<u>Downstream Trash</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>no</u> light rain, (drizzle)							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>09</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>09:45</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket	Flow Meter	<u>Estimated</u> not deep enough for flow meter + lip for bucket.			
Flow Meter	Flow Speed (ft/s): <u>0.15</u>		Water Depth (in): <u>1.25</u>	Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TTT Rental, Roplus</u>			Turbimeter: <u># 1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>14.5</u>	<u>69.5</u>	<u>8.35</u>	<u>82.0</u>	<u>6.86</u>	<u>54.3</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<u>Tap #2</u>		
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>None</u>						
COLOR	<u>Light tan.</u>						
CLARITY	<u>Slightly cloudy</u>						
FLOATABLES	<u>-</u>						
DEPOSITS OR STAINS	<u>-</u>						
SHEEN	<u>-</u>						
SURFACE SCUM	<u>-</u>						
DEBRIS	<u>-</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Low flow, overcast</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>10</u>		DATE: <u>8/24/2020</u>		SAMPLE TIME: <u>10:05</u>			
OUTFALL/NODE ID: <u>525-2</u>		PHYSICAL LOCATION: <u>Ben Boeke S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter			
Flow Meter		Flow Speed (ft/s): <u>2.72</u>		Water Depth (in): <u>1.5</u>			
Pipe Diam (in): <u>24</u>		Bucket Measurements		Time 1 (s)			
Time 2 (s)		Time 3 (s)		Time 4 (s)			
Total Time		Rate (gal/s)		Bucket: 1-gal 5-gal			
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Pro Plus</u>		Turbimeter: <u>#1</u>			
Temp (°C)		SpC (µS/cm)		DO (mg/L)			
DO (% sat)		pH		Turb (NTU)			
MEASUREMENT		<u>11.7</u>		<u>312.9</u>			
FIELD REPLICATE		<u>9.87</u>		<u>90.9</u>			
<u>6.57</u>		<u>9.89</u>					
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL		BOD		TSS	
SWM <u>10</u> -02		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
SWM _____-02 Dup		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
MS/MSD or Lab Dup Samples		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
FIELD QC (Trip/Equip)		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS			
ODOR		<u>none</u>					
COLOR		<u>none</u>					
CLARITY		<u>clear</u>					
FLOATABLES		<u>none</u>					
DEPOSITS OR STAINS		<u>none, iron stain on concrete below outfall</u>					
SHEEN		<u>none</u>					
SURFACE SCUM		<u>none</u>					
DEBRIS		<u>none</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>high water level in stream, overcast</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>LL</u>		DATE: <u>8/24</u> /2020		SAMPLE TIME: <u>11:10</u>		
OUTFALL/NODE ID: <u>348-1</u>		PHYSICAL LOCATION: <u>John's Rd. and Botanical Cir.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket		<u>Flow Meter</u>		
Flow Meter	Flow Speed (ft/s): <u>0.05</u>		Water Depth (in): <u>4.75</u>		Pipe Diam (in): <u>36</u>	
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Proplus</u>		Turbimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>13.9</u>	<u>112.6</u>	<u>7.26</u>	<u>70.0%</u>	<u>6.71</u>	
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>LL</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -02 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:				Sampler's Initials: <u>KG</u>		
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>None / Earthy</u>					
COLOR	<u>Clear / Slight Yellow</u>					
CLARITY	<u>Slight Cloud</u>					
FLOATABLES	<u>-</u>					
DEPOSITS OR STAINS	<u>-</u>					
SHEEN	<u>-</u>					
SURFACE SCUM	<u>-</u>					
DEBRIS	<u>-</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Cloudy, Slow flow</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

1220 P.m
12:25 Dup
STORM # 2

STATION ID: SWM 12 DATE: 8/21/2020 SAMPLE TIME: 12:30 MS/MSD

OUTFALL/NODE ID: 1454-1 PHYSICAL LOCATION: Lynwood Detention Pond

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	<u>Flow Meter</u>				
Flow Meter	Flow Speed (ft/s): <u>1.45/1.30</u>	Water Depth (in): <u>1.5</u>	Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>TFT Rental, ProPlus</u>			Turbimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>13.2</u>	<u>171.9</u>	<u>8.79</u>	<u>83.5</u>	<u>7.35</u>	<u>48.5</u>
FIELD REPLICATE	<u>13.2</u>	<u>167.6</u>	<u>8.58</u>	<u>81.8</u>	<u>7.38</u>	<u>42.6</u>

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>12</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>12</u> -02 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FIELD QC (Trip/Equip)				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Description of QC Samples:

Sampler's Initials: KG

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>None</u>	
COLOR	<u>Slight tan/brown</u>	
CLARITY	<u>Slight cloudy</u>	
FLOATABLES	<u>-</u>	
DEPOSITS OR STAINS	<u>Slight iron stain</u>	
SHEEN	<u>-</u>	
SURFACE SCUM	<u>-</u>	
DEBRIS	<u>-</u>	

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Cloudy, Rain Stopped

Photos: Yes No

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: <u>SWM 03</u>		DATE: <u>08/31/2020</u>		SAMPLE TIME: <u>9:55</u>		
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>old Seward / sylvan w.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <u>TTT Flow Meter</u> convert to Eng feet				
Flow Meter	Flow Speed (ft/s): <u>1.57</u>	Water Depth (in): <u>2.5</u>		Pipe Diam (in): <u>36</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental 556</u>		Turbimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>11.19</u>	<u>129</u>	<u>9.66</u>	<u>88.1</u>	<u>7.47</u>	
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>03</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -03 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>none</u>					
COLOR	<u>light gray</u>					
CLARITY	<u>slightly cloudy</u>					
FLOATABLES	<u>none</u>					
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>none</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	<u>none</u>					
↓ <u>cloudy</u> WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS: ↓ <u>leaves</u> ↓						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

Reviewed By: [Signature]

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>04</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: <u>10:00</u>		
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>old Seward / Sylvan E</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket		<u>TIT</u> <u>Flow Meter</u> <u>0.25'</u>		
Flow Meter	Flow Speed (ft/s): <u>0.67</u>	Water Depth (in): <u>3.5</u>	Pipe Diam (in): <u>18</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TIT Rental, 556</u>		Turbidimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>13.14</u>	<u>202</u>	<u>9.05</u>	<u>86.2</u>	<u>7.47</u>	<u>6.20</u>
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>04</u> -03	✓	✓	✓			✓
SWM _____ -03 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>none</u>					
COLOR	<u>clear none</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>none</u>					
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>none</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	<u>none</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>lightly raining, leaves ↓</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

Reviewed By: RS Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>05</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: <u>11:00</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE HS.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>0.1'</u>			
Flow Meter	Flow Speed (ft/s): <u>1.32</u>		Water Depth (in): <u>2</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TIT Rental, 556</u>		Turbimeter: <u>41</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>12.47</u>	<u>159</u>	<u>8.96</u>	<u>83.1</u>	<u>7.25</u>	<u>16.9</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>05</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<u>Tap #3</u>		
Description of QC Samples:			Sampler's Initials: <u>LS</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>slightly cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>light rain, leaves +</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: R Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: <u>SWM 06</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: <u>11:30</u>		
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maple wood st.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <u>TTT</u>		Flow Meter <u>0-1'</u>		
Flow Meter	Flow Speed (ft/s): <u>2.16</u>	Water Depth (in): <u>1 3/8</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Rentals 556</u>		Turbidimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>12.11</u>	<u>103</u>	<u>8.76</u>	<u>81.5</u>	<u>7.02</u>	
FIELD REPLICATE					<u>11.8</u>	
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>06</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -03 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>none</u>					
COLOR	<u>none</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>none</u>					
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>none</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	trash DS <u>trash DS</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>light rain, leaves ↓</u>						
<u>cobble rounded</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

Reviewed By: RS Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>07</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: <u>1145</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Hwy N</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter			
Flow Meter		Flow Speed (ft/s): <u>1.74</u>		Water Depth (in): <u>1.75</u>			
Bucket Measurements		Time 1 (s)		Time 2 (s)			
Bucket: 1-gal 5-gal		Time 3 (s)		Time 4 (s)			
		Total Time		Rate (gal/s)			
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, 556</u>		Turbidimeter: <u>#1</u>			
Temp (°C)		SpC (µS/cm)		DO (mg/L)			
MEASUREMENT		DO (% sat)		pH			
FIELD REPLICATE		Turb (NTU)					
		<u>12.87</u>		<u>57</u>			
		<u>9.41</u>		<u>89.1</u>			
		<u>7.38</u>		<u>242</u>			
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>07</u> -03		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					TB #3		
Description of QC Samples:						Sampler's Initials: <u>LS</u>	
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS			
ODOR		<u>None</u>					
COLOR		<u>Brown</u>					
CLARITY		<u>Cloudy</u>					
FLOATABLES		<u>none</u>					
DEPOSITS OR STAINS		<u>none</u>					
SHEEN		<u>none</u>					
SURFACE SCUM		<u>none</u>					
DEBRIS		<u>none</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Good flow, Raining, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: R Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: <u>SWM 08</u>		DATE: <u>8 / 31 / 2020</u>		SAMPLE TIME: <u>12:00, 12:03 pup</u>			
OUTFALL/NODE ID: <u>86-1</u>		PHYSICAL LOCATION: <u>Seward Hwy 5</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) <u>Bucket</u> <u>Dup: 7.91</u>		<u>Flow Meter</u> <u>TIT</u>		<u>0.4'</u>			
Flow Meter	Flow Speed (ft/s): <u>8.08</u>	Water Depth (in): <u>4 7/8</u>		Pipe Diam (in): <u>48</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TIT Rental, 556</u>			Turbimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>12.70</u>	<u>74</u>	<u>9.06</u>	<u>85.7</u>	<u>7.15</u>	<u>60.7</u>	
FIELD REPLICATE	<u>12.72</u>	<u>70</u>	<u>9.06</u>	<u>85.5</u>	<u>7.13</u>	<u>62.4</u>	
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
<u>SWM 08 -03</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<u>SWM 08 -03 Dup</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>Brown</u>						
CLARITY	<u>Cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>fine</u>						
DEBRIS	<u>Trash DS</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>raining</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>09</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: <u>12:35</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>0.25'</u>			
Flow Meter	Flow Speed (ft/s): <u>0.96</u>		Water Depth (in): <u>1.75</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, 556</u>		Turbimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>13.48</u>	<u>73</u>	<u>8.75</u>	<u>83.9</u>	<u>7.25</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<u>Tip blank #3</u>		
Description of QC Samples:				Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Slightly Petroleum.</u>						
COLOR	<u>Slightly brown - tinted</u>						
CLARITY	<u>cloudy - slightly.</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>Trash DS</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>light rain</u>			<u>Field Audit by C. Helmerichs.</u>				
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

LS
~~CP12~~
~~78~~

Reviewed By: R. Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>LO</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: 12:46 ^{VAD} <u>12:50</u>		
OUTFALL/NODE ID: <u>525-2</u>		PHYSICAL LOCATION: <u>Ben Boeke S.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket				
Flow Meter		Flow Meter <u>20 sec.</u>				
Flow Meter	Flow Speed (ft/s): <u>4.05</u>	Water Depth (in): <u>3"</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #	YSI: <u>ITT Rental, 556</u>			Turbimeter: <u>#1</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>12.39</u>	<u>134</u>	<u>0.3</u> ^{9.19}	<u>86.2</u>	<u>6.99</u>	
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>LO-03</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM <u>LO-03 Dup 42</u>						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:				Sampler's Initials: <u>KG</u>		
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	—					
COLOR	—					
CLARITY	<u>slight tea</u>					
FLOATABLES	<u>hint cloudy</u>					
DEPOSITS OR STAINS	<u>rust, iron</u>					
SHEEN	—					
SURFACE SCUM	—					
DEBRIS	—					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>light rain, 00 - Audit by P. Helmrichs</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

KS
~~103~~

Reviewed By: Spencer

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>11</u>		DATE: <u>8/31/2020</u>		SAMPLE TIME: <u>09:10</u>			
OUTFALL/NODE ID: <u>348-1</u>		PHYSICAL LOCATION: <u>John's Rd and Botanical Cr.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>26'</u>			
Flow Meter	Flow Speed (ft/s): <u>0.4</u>		Water Depth (in): <u>7.25</u>		Pipe Diam (in): <u>36</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTI Rental, 556</u>		Turbimeter: # <u>1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>12.20</u>	<u>43</u>	<u>12.25</u>	<u>144.7</u>	<u>6.42</u>		
FIELD REPLICATE			<u>9.74</u>	<u>107</u>			
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>11</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u> </u> -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>Slightly cloudy</u>						
FLOATABLES	<u>Birch seeds</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>Trash DS</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>light rain</u>							
<u>p1.309 -> 1.413 Cal Sp cond.</u>							
<u>Recalibrated Conductivity onsite</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: [Signature]

Date: 9-9-2020

Page of

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>1 2</u>		DATE: <u>8 131 12020</u>		SAMPLE TIME: <u>10:20 , 10:25</u>			
OUTFALL/NODE ID: <u>1454-1</u>		PHYSICAL LOCATION: <u>Lynwood Detention Pond</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket ^{Dsp 2.74}		Flow Meter ^{convert to Eng Feet}			
Flow Meter	Flow Speed (ft/s): <u>2.6</u>		Water Depth (in): <u>2.25</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TII Rental, 556</u>		Turbimeter: <u>#1</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>11.87</u>	<u>247</u>	<u>9.73</u>	<u>90.1</u>	<u>7.24</u>		
FIELD REPLICATE	<u>11.86</u>	<u>258</u>	<u>9.28</u>	<u>89.7</u>	<u>7.25</u>		
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>1 2</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>1 2</u> -03 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FIELD QC (Trip/Equip)					<u>Trip Blank #3</u>		
Description of QC Samples:				Sampler's Initials: <u>LS</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Metallic, slight</u>						
COLOR	<u>Brown</u>						
CLARITY	<u>Cloudy</u>						
FLOATABLES	<u>None</u>						
DEPOSITS OR STAINS	<u>None</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Light rain, grasses</u>							
Photos: <u>Yes</u> No							

Dup
10:30
ms/ms

LS
~~185~~
~~194~~

Reviewed By: 

Date: 9-9-2020

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>03</u>		DATE: <u>9 / 17 / 2020</u>		SAMPLE TIME: <u>9:50</u>			
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>old Seward / Sylvan W</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>Cast Rod Depth</u>					
Flow Meter	Flow Speed (ft/s): <u>1.36</u>	Water Depth (in): <u>2 in</u>		Pipe Diam (in): <u>36</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TTT, ProPlus</u>		Turbimeter: <u>HF</u> <u>TT</u>				
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>10.0</u>	<u>146.4</u>	<u>9.33</u>	<u>82.3</u>	<u>7.35</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>03</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	-						
COLOR	-						
CLARITY	<u>Quite Clear</u>						
FLOATABLES	-						
DEPOSITS OR STAINS	-						
SHEEN	-						
SURFACE SCUM	-						
DEBRIS	-						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Rain, Windy, Leaves Downstream</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>04</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>9:55</u>			
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>Old Seward / Sylvan E.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) Bucket <u>0.46 ft/s</u> <u>Flow Meter</u> <u>0.24 Red Depth</u>							
Flow Meter	Flow Speed (ft/s): <u>0.46</u>		Water Depth (in): <u>2.25 in</u>		Pipe Diam (in): <u>18</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TIT</u> , <u>ProPlus</u>		Turbidimeter: <u>HF Scientific</u> , <u>TIT</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>11.8</u>	<u>220.4</u>	<u>9.06</u>	<u>83.9</u>	<u>7.36</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>04</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>EP KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	—						
COLOR	<u>Slight / Tea Tan</u>						
CLARITY	<u>Pretty Clear</u>						
FLOATABLES	—						
DEPOSITS OR STAINS	—						
SHEEN	—						
SURFACE SCUM	—						
DEBRIS	—						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Rainy, Leaves Down</u>							
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>05</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>11:05</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE HS</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>0.27 Rod Depth</u>					
Flow Meter	Flow Speed (ft/s): <u>1.73 ft/s</u>	Water Depth (in): <u>2.25 in</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT, ProPlus</u>		Turbidimeter: <u>HF, TTT</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.1</u>	<u>76.1</u>	<u>10.25</u>	<u>93.0</u>	<u>7.09</u>	<u>37.84</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>05</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)				<u>Tip Blank #4</u>			-
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	-						
COLOR	<u>Slight Brown</u>						
CLARITY	<u>Slight Cloud</u>						
FLOATABLES	-						
DEPOSITS OR STAINS	-						
SHEEN	-						
SURFACE SCUM	-						
DEBRIS	-						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Slight Rain - Good flow!</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>06</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>11:40</u>		
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maplewood st.</u>				
OUTFALL FLOW MEASUREMENTS <u>0.2 ft</u>						
Flow Method (circle)		Bucket		Flow Meter off <u>Rod Depth</u>		
Flow Meter	Flow Speed (ft/s): <u>1.29 ft/s</u>	Water Depth (in): <u>2 in</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT</u> , <u>ProPlus</u>		Turbidimeter: <u>TTT</u> , <u>H F Scientific</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>10.5</u>	<u>37.6</u>	<u>10.80</u>	<u>96.9%</u>	<u>6.99</u>	
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>06</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -04 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	—					
COLOR	<u>Slight tan</u>					
CLARITY	<u>Slight Cloudy</u>					
FLOATABLES	—					
DEPOSITS OR STAINS	—					
SHEEN	—					
SURFACE SCUM	—					
DEBRIS	—					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Rain. Good Flow. Corroded Culvert</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>07</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>12:00</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>0.2ft Rod Depth</u>			
Flow Meter	Flow Speed (ft/s): <u>1.94 ft/s</u>	Water Depth (in): <u>2.5in</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT, Probes</u>		Turbimeter: <u>HF, TTT</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>10.8</u>	<u>313</u>	<u>10.87</u>	<u>98.0</u>	<u>7.13</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<u>Trip Blank #4</u>		
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	-						
COLOR	<u>Brown/Grey</u>						
CLARITY	<u>Cloudy</u>						
FLOATABLES	-						
DEPOSITS OR STAINS	-						
SHEEN	-						
SURFACE SCUM	-						
DEBRIS	-						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Hard Rain, Strong Flow. Leaves down</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

12:10 Primary
 12:15 Dup

STATION ID: SWM 08 DATE: 9/17/2020 SAMPLE TIME: 12:15 Dup

OUTFALL/NODE ID: 86-1 PHYSICAL LOCATION: Seward Highway S.

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	<u>Flow Meter</u> <u>0.5 ft Rod Depth</u>				
Flow Meter	Flow Speed (ft/s): <u>10.35 ft/s</u>	Water Depth (in): <u>6 in</u>	Pipe Diam (in): <u>48</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						

Dup H₂O
 10.54 ft,
 0.5 ft

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>TTT, Proplus</u>			Turbidimeter: <u>HF, TTT</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>10.7</u>	<u>33.9</u>	<u>11.4</u>	<u>102.3</u>	<u>7.00</u>	<u>54.81</u>
FIELD REPLICATE	<u>10.8</u>	<u>33.2</u>	<u>11.2</u>	<u>101.4</u>	<u>7.02</u>	<u>56.13</u>

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>08</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>08</u> -04 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							

Description of QC Samples:

Sampler's Initials: KG

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	—	
COLOR	<u>Light Brown</u>	
CLARITY	<u>Light Cloudy</u>	
FLOATABLES	—	
DEPOSITS OR STAINS	—	
SHEEN	—	
SURFACE SCUM	—	
DEBRIS	—	

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Heavy Rain / Heavy Flow. White Water

Photos: Yes No

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>09</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>12:45</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke N.</u>					
OUTFALL FLOW MEASUREMENTS <u>0.4 ft Rod Depth</u>							
Flow Method (circle)		Bucket		<u>Flow Meter</u>			
Flow Meter	Flow Speed (ft/s): <u>1.00 ft/s</u>	Water Depth (in): <u>6.0 in</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TTT, Proplus</u>			Turbimeter: <u>HF TTY</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.0</u>	<u>33.6</u>	<u>10.52</u>	<u>96.2</u>	<u>7.04</u>	<u>78.07</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)					<u>TB #4</u>		
Description of QC Samples:				Sampler's Initials: SP <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	—						
COLOR	<u>Light Tan</u>						
CLARITY	<u>Light Cloud</u>						
FLOATABLES	—						
DEPOSITS OR STAINS	—						
SHEEN	—						
SURFACE SCUM	—						
DEBRIS	—						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Heavy Rain / Heavy Flow</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>10</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>12:55</u>			
OUTFALL/NODE ID: <u>S25-2</u>		PHYSICAL LOCATION: <u>Ben Boeke S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>~0.3 ft Rod Depth</u>					
Flow Meter	Flow Speed (ft/s): <u>4.37</u>	Water Depth (in): <u>5in</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT, Pro Plus</u>		Turbidimeter: <u>HF, TTT</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>10.6</u>	<u>98.5</u>	<u>10.7</u>	<u>98.6</u>	<u>6.82</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>10</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Organic</u>						
COLOR	<u>Brown/Dark Brown</u>						
CLARITY	<u>Cloudy</u>						
FLOATABLES	<u>—</u>						
DEPOSITS OR STAINS	<u>Rust Iron Stain</u>						
SHEEN	<u>—</u>						
SURFACE SCUM	<u>—</u>						
DEBRIS	<u>—</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Heavy Rain / Heavy Flow</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

Reviewed By: Kacy Elchman

Date: 9/21/20

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>11</u>		DATE: <u>9/17/2020</u>		SAMPLE TIME: <u>09:10</u>		
OUTFALL/NODE ID: <u>348-1</u>		PHYSICAL LOCATION: <u>John's Rd & Botanical Cir.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <u>Flow Meter</u> @ <u>0.7ft</u> Depth				
Flow Meter	Flow Speed (ft/s): <u>0.44</u>	Water Depth (in): <u>9.25</u>		Pipe Diam (in): <u>36</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #	YSI: <u>TTT Rental, Proplus</u>		Turbimeter: <u>HF, TTT</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>10.8</u>	43.1	9.97	<u>89.9</u>	<u>6.82</u>	<u>65.12</u>
FIELD REPLICATE		<u>EP</u>	<u>EP</u>			
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>11</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -04 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:				Sampler's Initials: EP <u>KG</u>		
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>None</u>					
COLOR	<u>Grey brown</u>					
CLARITY	<u>Cloudy</u>					
FLOATABLES	<u>Birch seeds & Small</u>					
DEPOSITS OR STAINS	<u>—</u>					
SHEEN	<u>—</u>					
SURFACE SCUM	<u>—</u>					
DEBRIS	<u>—</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Rain</u>						
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

Reviewed By: Katy Galtman

Date: 9/21/20

Page 1 of 1

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

10:15 AM

STATION ID: SWM <u>12</u>	DATE: <u>9/17/2020</u>	SAMPLE TIME: <u>10:20 Dup</u>
OUTFALL/NODE ID: <u>1454-1</u>	PHYSICAL LOCATION: <u>Lynwood Detention</u> <u>10:25 MS/MSD</u>	

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	<u>Flow Meter</u> <u>0.2 Rod Depth</u>				
Flow Meter	Flow Speed (ft/s): <u>2.69</u>	Water Depth (in): <u>2.25</u>	Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						

Dup. Flow
 0.2ft³
 2.57 ft/s

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>TTT</u>	Turbidimeter: <u>HF TTT</u>				
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>10.5</u>	<u>168.9</u>	<u>90.2%</u>	<u>10.07</u>	<u>7.17</u>	<u>131.6</u>
FIELD REPLICATE	<u>10.5</u>	<u>171.3</u>	<u>89.6%</u>	<u>9.99</u>	<u>7.17</u>	<u>131.8</u>

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>12</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>12</u> -04 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FIELD QC (Trip/Equip)					<u>Trip Blank #4</u>		

Description of QC Samples:

Sampler's Initials: KG

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>-</u>	
COLOR	<u>Brown</u>	
CLARITY	<u>Cloudy</u>	
FLOATABLES	<u>-</u>	
DEPOSITS OR STAINS	<u>Iron Rust</u>	
SHEEN	<u>-</u>	
SURFACE SCUM	<u>-</u>	
DEBRIS	<u>-</u>	

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Rainy - Steady

Photos Yes No